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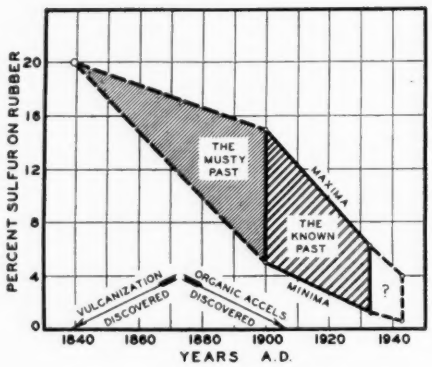
INCORPORATED

230 Park Avenue, New York

LOW-SULFUR COMPOUNDING

A Way to Improvements in the Quality and Durability of Rubber Products



Commercial Sulfur Ratios—
Past, Present and Future

Undeniably, the trend over the past several years has been to use smaller and smaller percentages of sulfur in many articles manufactured of rubber.

Low sulfur is not a cure-all or panacea for all rubber compounding troubles, but it seems to be worthy of consideration in many places where experimental work is being done.

Low-sulfur compounds are easy to process—they are not scorchy.

They are better aging, more resilient, resistant to heat, oils and fats, and less subject to discoloration.

Read the story in the Vanderbilt News for March-April, 1933, Vol. 3, No. 2

INDIA RUBBER WORLD

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Volume 88 **New York, May 1, 1933** **Number 2**

Rubber under Tension

And Its Function as Thread in a Golf Ball

I. Torrence Gurman

THE utilization of rubber thread to produce resilience and related qualities in a ball dates back several decades. The adaption of this material under high tension, together with a cover of gutta percha or balata to produce an improved golf ball was the basis of an invention[1] made more than 30 years ago. From that time on the value of rubber thread and tape for golf ball construction has been recognized, and their use practiced, but their true functions have not been determined or fully appreciated—and this term may be interpreted in its widest sense. A third of a century has passed since the letters patent were granted, a period replete with improvements, inventions, discoveries, and development by far greater than those in any like period in history. The rubber field has carried out its part in this progress very creditably, but in regard to the determination of the principles involved in the use of rubber under tension there has been no real advance. The knowledge of the "Haskell" invention became public property in 1899, but in the interim very little effort has been expended, and, consequently, very little accomplished, toward evaluating the factors that govern the functions of these threads when applied under tension to the formation of the vital section of the present type of ball, despite the fact that tens of millions of dollars have been spent for this material.

In an earlier article[2] the writer touched on the matter as regards the effect in general that it had on the kinetics of the ball in play. This is but a small part of its function. Nor is the indifference, for it is just that, to the action of rubber thread in a golf ball due to the fact that such function is unimportant, or that it is such common knowledge as to warrant indifference. On the contrary the type of thread used, the manner in which it is used, and the proper control and adjustment of conditions under which it is used are all-important; while a thorough knowledge and understanding of the factors involved are not available to the manufacturer or consumer of golf ball thread, let alone their being applied. While the use of thread has not exactly been haphazard, it has been considerably "by guess and by grace of Providence," or trial and error; "empirical" is the technical name for the practice, "inductive" for the reasoning.

How does the average golf ball manufacturer buy and use thread? In the last analysis, but 2 factors govern his actions. First, there is a consideration native to all purchases: namely, the cost per unit (weight or volume) of raw material; and second, the thread must run well in conjunction with the particular machines and winding methods employed by him (slightly modified if necessary). To assure himself (so he believes) of a fairly uniform product he may, but often does not, insist on limits within which must lie the elongation and tensile strength at the breaking point, and may even go so far as to run an aging test or require that one be run occasionally. To what avail? To what purpose except to contribute time, effort, and expense to the accumulation of more or less easily accessible statistics that, more likely than not, are never scanned critically or in perspective? If the elongation runs about 800% and the strength about 2,500 pounds per square inch, the thread is given the official or semi-official "O.K." without, in many cases, being given—if we may be permitted the use of 2 colloquialisms in one sentence—the "double-O."

Suppose the thread tested 3,000 pounds per square inch at 750% or 2,200 pounds per square inch of 880% or some other combination at the breaking point, what then? Would it be good enough for use in a well-made golf ball, or wouldn't it? Would it be more applicable for use in a "fast" ball or in a "tough" ball, or could it be used for either, as it is generally done, by merely changing the tension? If it be desired to produce balls that will give comparable performance from 2 or more stocks differing as

[1] Work and Haskell, U. S. Patent No. 622,834, April 11, 1899.

[2] "Golf Ball Dynamics," INDIA RUBBER WORLD, Sept. 1, 1931, pp. 56-58; Oct. 1, 1931, pp. 61-62.

do the above, which should we take as a standard of comparison: the compression test, the degree of elongation, or the stress on the thread being fed into the machine? Would we have to adopt a different *basic* standard for different types of balls? Does the matter of permanent set mean anything, and, if so, under what conditions should this set be measured? Which is more important, the stress at the breaking point, or that at—say—300% or 500% or the "critical point" in the stress-strain curve? Should the aging test be run on stock "at rest" or under stress? What stress? If under stress, should a wound ball or a molded one be used? Why? How? Is the aging oven to be preferred to the oxygen bomb; or are the best results obtained by subjection to sunlight, in the open or in water; or is a chemical test more reliable? A thread $\frac{1}{16}$-inch by 62 gage (0.016-inch) has a breaking strength of 3,100 pounds per square inch; while a $\frac{1}{16}$-inch by 33 gage (0.030-inch) has a breaking strength of 2,900 pounds per square inch. Which represents the better thread stock? Why? What part does surface tension play? What type of thread is best, and for what purposes: that cut along the grain, that cut across it (either directly, or diagonally), or that cut from grainless stock? Does the gage of the thread affect the final result? How about the uniformity of the gage or cut? Which thread yields a better ball, a lubricated or an unlubricated one? What type of lubricant is preferable? What determines the necessity of using a lubricated thread: the thread itself, the winding machine, the tension device, or the final purpose for which the ball is intended? These and diverse other questions suggest themselves and must be answered if one is to have an understanding of the functions of rubber thread so that the thread may be properly applied.

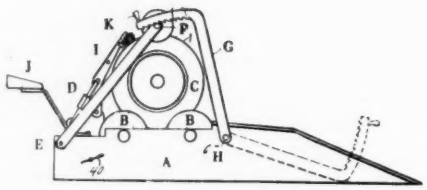
The companies selling chemicals to the rubber trade have performed considerable research work to enable them to advise their customers concerning the proper application of their products. A similar condition does not exist in regard to the producers of thread. Until recently most of the thread used in ball manufacture was supplied by companies directly or indirectly concerned in the production of golf balls themselves. That they did not advise their competitors in the proper application of their product is legion. The question as to whether their failure to do so was governed by the fact that they were in competition with their customers, or whether they did not themselves know, must remain, for the present at least, an academic one. The assumption that it consisted of a little of each would be at least 50% correct. In any case the consequence of this state of affairs is such that the answers to the majority of such questions as are mentioned above are beyond the ken of even the more progressive manufacturer. The author does not intend to answer all, or any, of these questions fully because of the extent of the field they cover, but will merely review the related facts so that the reader may, after a little thought and application, be led somewhat nearer a fuller knowledge of the *facta vera*.

Very often the winding operation in a golf ball plant is considered as one of the necessary but lesser evils and is treated as such. The refining and formulation of cover stock, the regulation of "vulcanization" conditions, the "preparation" of the ball after molding, the painting (including humidity and "baking" conditions) all seem to warrant technical supervision and control, while the winding is treated as so much red tape or brown tape, as the case may be. True, considerable attention is given to assure smooth running of the winding equipment; care is taken to prevent chafing; the wound balls are tested for hardness or "compression;" and a proper finishing layer is required to insure good bonding of the cover. True, also, that considerable fuss is made about insuring the sphericity of the center. In fact so much emphasis is placed on this phase of the operation, that, even allowing for its undoubted importance, one is often inclined to wonder whether the true values and functions of the winding operation are overlooked.

Not many years ago considerable attention was drawn to, and as considerable effort spent in, the possibility of making a ball more durable. Various formulations, some of them good and others not so good, were evolved to make the cover stock "cut-proof." After the excitement had somewhat subsided it was generally conceded that the winding played a far greater part in insuring durability than did all the other factors concerned. As the manufacture grows older in experience as well as in years, and greater in volume, more attention will, and of necessity must, be paid to the part which the thread plays in the manufacture of a golf ball. At the present time because of the financial conditions that prevail and because of the tendency toward lower priced balls which now exists, this all-important matter is somewhat lost in the shuffle to offset the influences of external forces. Now, however, the time is most opportune for taking up this phase of golf ball manufacture seriously, to establish the foundations for a future understanding of the issues involved. (*To be continued*)

Retreading Tires[1]

THE renewal of tire treads which have been worn through, by cementing or vulcanizing a new and additional strip of tread rubber upon it is not entirely satisfactory because the cement may not hold securely and the tread may be torn off by centrifugal force during high speed operation of the tire. Also in applying such treads it is customary to vulcanize them to the tires, and this reheating of the old rubber frequently causes serious injury which may result in a blowout.



Tire Tread Regroover

It is possible to restore a non-skid tread to an old tire simply by deepening or recutting the originally molded tread grooves without any heat treatment or cementing and without the addition of any new rubber to the tires.

The machine by which the work of recutting is accomplished is indicated in the illustration. It consists of a rack, *A*, carrying a pair of motor driven concave rollers, *B*, *B*, for supporting and revolving the tire, *C*. The bar, *D*, pivoted at *E*, carries on its opposite end a grooved wheel, *F*, which is drawn down upon the tire by engagement of a hand ratchet bar, *G*, pivoted at *H*.

Thus held in place and revolved, the tread of the tire is recut by the tool, *I*, which is applied by the operator seated at *J*. Cutting is facilitated by a water soaked sponge, *K*, surrounding the cutting tool. The circumferential grooves are quickly cut in this manner, after which the cross grooves are cut by hand.

[1]U. S. Patent No. 1,894,347, Jan. 17, 1933.

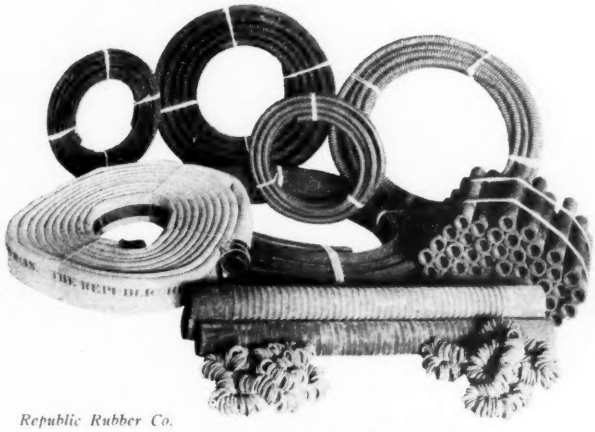
Railway Rubber Goods

Classified Material Expenditures—Specification for Rubber Goods—Comparison of Specification Types—List and Details of Rubber Goods—Important Future Railway Uses of Rubber

Webster Norris

THE business of supplying the rubber goods requirements of railways is large and important to manufacturers of mechanical rubber goods. Unfortunately for them, however, the goods for the most part are so closely limited by specifications and tests that the business lacks attraction to all except the larger manufacturers.

The present article is an endeavor to present the variety of rubber products bought by American railways, their general construction, and some of the possibilities of new railway application of rubber.



Republic Rubber Co.

Fig. 1. A Typical Line of Railway Hose and Air Brake Gaskets

The items listed in Table I, quoted from an authoritative source[1], will serve to indicate the magnitude of the railway plant of the United States and the scope of the annual purchases of material and supplies necessary to its maintenance and operation. The figures given refer to Class I railways. which are those lines the operating revenues of which amount to $1,000,000 or more each year. The item of passenger cars reported does not include cars owned by the Pullman Co. or other private concerns.

TABLE I. CLASS I RAILWAY PLANT AND PURCHASES, 1931*

Total operated mileage..	430,000	Fuel $224,200,000	
Passenger cars in service, railway owned	51,750	Forest products	$75,500,000
Locomotives in service...	55,400	Iron and steel products.	$220,000,000
Freight cars in service..	2,200,000	Miscellaneous supplies ..	$175,000.000

* *Railway Age* data.

Specifications of equipment employed in railway plant construction and operation as well as numerous rules and codes of recommended practice are formulated and issued by the American Railway Association.[2] Those that relate to rubber products originated by the Operating, Transportation, and Mechanical Divisions are listed in Table II. About half these specifications concern insulated wires and cables. The remainder relate to mechanical rubber goods, chiefly hose, and all concern critically important articles.

It should be stated, however, that they do not actually reflect the progress of rubber chemistry and technology. This distinct disadvantage is cited by a leading rubber chemist and technologist, who, having described the improvements made in recent years in rubber insulation[3], indicates how a purchaser under specifications can take advantage of these recognized improvements. In reference to insulated wire and cable specifications 2 general types are recognized, "materials" and "performance" specifications. A "mixed" or "compromise" specification is sometimes written. The importance of performance specifications to large consumers of rubber goods is clearly evident in the remarks on the 3 types named, quoted from the reference cited, as follows:

"Let us consider the relative merits of the 3 types. The 'materials' specification assures the purchaser only that goods accepted in the future will not be any worse than those considered satisfactory in the past. It is an equally effective obstacle to improvement, for it restricts the manufacturer to certain prescribed materials and the service of the product is necessarily limited by this choice. New ingredients which would improve the electrical properties or prolong the life of the wire or cable in service cannot be utilized.

"The 'mixed' or 'compromise' type is undoubtedly an improvement over the strict materials type in that the performance tests insure the required service and the new ingredients included permit a better compound. On the other hand, still better materials which are soon made available by progress in

TABLE II. A.R.A. SPECIFICATIONS FOR RUBBER GOODS

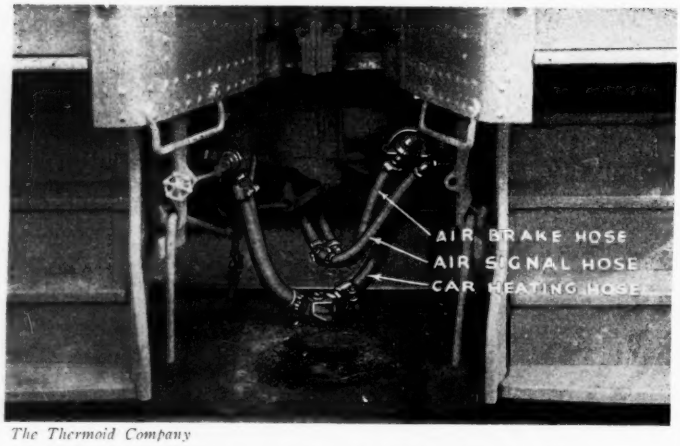
Number	Title
	OPERATING DIVISION
	Telegraph and Telephone Section
2-G-2	"Braided Office Cable of Non-Quadded Twisted Pairs of Rubber Insulated No. 16 A.W.G."
2-G-15	"Twisted Fair Waxed Braid Rubber Insulated Inside Wire"
2-G-16	"Single Conductor Wax Braid Rubber Insulated Inside Wire"
2-G-30	"Friction Tape (ARA-1-A)"
2-G-34	"Rubber Insulating Tape (ARA-2-A)"
	Signal Section
11,132	"Rubber Compound Insulated Signal Wire-Mineral Matter"
5,632	"Rubber Insulating Tape (Mineral Matter Compound)"
9,132	"Lead Covered Cable-Mineral Matter Compound"
	"Insulated Signal Wire," Approved Mar., 1921; Sept., 1931; Sept., 1932
	MECHANICAL DIVISION
A-1924	"Methods of Tests for General Mechanical Rubber Goods"
	Axle Light Belting
	Air Brake and Train Air Signal Hose
	Air, Gas, and Oxygen Wrapped and Braided Hose
	Fire Hose
	Steam Hose
	Tender Tank Hose
	Wrapped Cold Water Hose
	Air Brake Hose Gaskets

[1] A Yearbook of Railroad Information. 1932 edition. Prepared by Western Railways' Committee on Public Relations. Published by Committee on Public Relations of the Eastern Railroads, 143 Liberty St., New York, N. Y.

[2] Divisions and Sections of the American Railway Association, 32 Vesey St., New York, N. Y.

[3] "Modern Progress in Rubber Compounding." Charles R. Boggs, vice president, Simplex Wire & Cable Co., Boston, Mass. Presented before Signal Section of American Railway Association, New York, N. Y., May 13, 1931.

the art are excluded until the materials requirements have again been revised. Thus, while the performance part of the specifications insures a certain quality, the materials requirements effectually block any further improvement. Periodic revisions of the specifications are only a partial remedy; for no matter how quickly made, they are always lagging behind the art. To make proper revisions the purchaser would have to keep himself informed on all the advances of the art. This is impractical and experience shows that he has not done so in the past.



The Thermoid Company

Fig. 2. Air Brake, Air Signal, and Car Heating Hose

"The 'performance' type of specification is free from these objections. While it fixes the lower limits of ability to render service, it does not in any way prevent or delay the making of better products. Improvements due to new materials and methods do not necessitate any revision whatever, for surely no one objects to getting something better than he demands. Unrestricted by any prescriptions as to materials and processes, the manufacturer is free, by the proper choice of them, to exceed the requirements or to satisfy them at lower cost. If the purchaser desires to raise the limits it can be easily and quickly done without any fundamental revision. This type of specification is an insurance, not an obstacle. The way to take advantage of modern progress is to purchase on performance specifications."

The rubber goods used in railway service, aside from insulated wire and cables, are mostly those classified as mechanical rubber goods, especially hose for many special purposes. Those considered essential to safe and efficient operation of trains or otherwise mechanically important in service are the subjects of American Railway Association specifications. The items listed in Table III represent practically all of the lines of mechanical rubber goods both specified and unspecified.

TABLE III. RUBBER GOODS FOR RAILWAY SERVICE

Belting, Axle Lighting*	Miscellaneous Rubber Goods
Conveyer	Bumpers, Vestibule Curtain
Power Transmission	Gaskets, Molded Air Brake Coupling*
Hose, Air Brake*	Assorted Cut
Air, Train Signal*	Headlight
Air, Gas, and Oxygen	Matting, Corrugated
Boiler Washout	Knob
Car Heating Steam*	Pyramid
Coal Sprinkling	Nosing, Carpet
Engine Washing	Packing, C. B. S. Sheet
Fire*	Red Sheet
Gasoline	Pure Gum Sheet
Oil Spraying	Pure Gum Strip
Pneumatic Tool	Pads and Bumpers
Radiator	Plugs, Basin
Sandblast	Sash Rubber
Steam*	Tiling, Lavatory Sheet
Suction, S. B.	Tubing, General Purpose
Tender Tank*	Valves, Hard
Vacuum Cleaner	Medium
Water, Wrapped Cold*	Soft
Welding*	Vestibule Curtains

* Purchased by A.R.A. specifications.

The construction of rubber goods for railways is indicated below for certain of the more important items.

Railway Hose

Cold water hose of wrapped ply construction is used for general water conducting purposes, such as car and engine washing, boiler washout, coal sprinkling, etc. Several other duck-ply hose named in Table III are made of special rubber and fabric constructions best adapted to withstand the severity of the designated surfaces such as for oil and paint spraying, gasoline, sandblast, pneumatic tool, vacuum cleaner, etc. See Figure 1.

Where a bursting test is specified, it is conducted after the A.R.A. method[4] quoted as follows:

Hydrostatic Pressure Test

"The pressure test for hose shall be made by means of a hand or power driven hydrostatic pump or an accumulator system. The hose shall be connected to the water line or pump and filled with water, allowing the air to escape, and a pressure of 10 pounds per square inch applied. The original measurements shall then be taken. Pressures may be measured with a calibrated gage of any design or make. The increase in pressure shall be constant and at the rate of approximately 1,000 pounds per minute.

"Time Pressure Test. The pressure shall be raised at the above rate until the designated pressure is reached and held at that pressure for 10 minutes, after which the pressure shall be increased at the same rate until failure.

"Bursting Test. The pressure shall be raised at the above rate until failure."

Air Brake and Air Signal Hose

Air brake and train signal air hose have a tough rubber inner tube. The duck fabric of the hose is thoroughly frictioned and skimmed strongly to unite the plies. The reenforced outer cover withstands the effect of the sun. Standard air brake hose is 1⅜ by 22 inches, and air signal 1½ by 22 inches; both are pliable and have capped ends to exclude moisture from the fabric. Train air signal hose is also made in lengths of 50 feet.

Air, gas, or welding hose is built with special regard to its use under high pressure as in welding where bursting of either the oxygen or acetylene lines might cause a bad explosion with danger to life. The tube is compounded for resistance to deterioration to gases. The fabric is of highest standard to withstand bursting, and the rubber cover well adapted to protect the hose from damage in service.

Car heating steam hose is made in short length, 1⅝ by 24 inches, for car couplings and also in 50-foot lengths for yard use in preliminary heating of detached trains. For this service steam hose is subjected to particularly destructive effects of high temperature, pressure, flexing, and abrasion. In operating very long passenger trains 1⅝-inch steam hose is inadequate; therefore 2-inch diameter metal tubing with swing joints has been standardized for car connections as of October, 1931.

Remarkably durable steam hose can be secured, however, by compounding rubber with heat resisting materials, curing the stock with low modulus, and constructing the hose with relatively heavy tube, and a skim of rubber on one side of the frictioned duck. The latter is firmly woven to resist heavy pressures.

Gates Rubber Co.

Fig. 3. Oil, Gas, Oxygen, and Acetylene Hose

[4] "General Instructions on Standard Methods of Tests for Mechanical Rubber Goods." Mechanical Division, A.R.A., Chicago, Ill.

(*To be continued*)

Plasticity Control

F. A. Middleton

EVERY routine procedure that adds to a manufacturer's continuous knowledge of the state of his materials is a definite step toward maintaining quality and efficiency of production. Successful manufacture is based on positive knowledge of what is taking place at every stage; only then can a producer be confident that he is doing the right thing in the right way all the time.

Cognizance of the factors determining the plasticity of rubber stock during manufacturing processes should be classed with those items about which definite information should be always available. Not only does this property of rubber affect its ease of processing in the unvulcanized state (mixing, warming up, calendering, tubing, plying up, and handling generally), but its regulation is an important feature in the maintenance of physical qualities after vulcanization. Excessive plasticity can have a 3-fold effect: (a) retard physical cure without affecting the coefficient of vulcanization; (b) decrease the load carrying capacity of the stock for a given elongation; and (c) decrease tensile strength, abrasive resistance, and wearing qualities generally.

Plasticity, therefore, should be considered in the same way as other vital properties of rubber stocks, such as specific gravity and cured hardness, which are usually the subject of regular examination. Karrer considers plasticity an integral property of a substance and has proposed the following quantitative definition of it:

"A substance has unit plasticity which deforms a definite amount under some standard conditions, when a force of one kilogramme per square centimeter acts upon it for one second, and the whole of the deformation is retained."

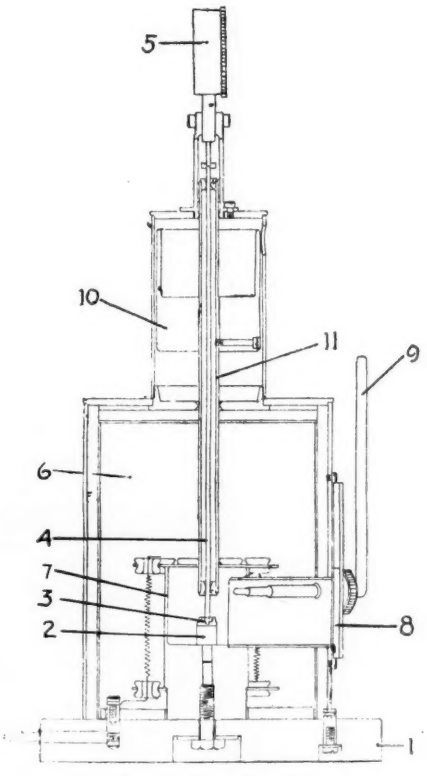
Rubber technologists on industrial staffs appreciate the important and diverse effects of plasticity upon many problems involving quality and productive expediency. There is no doubt that they are satisfied that this significant property of rubber should be intelligently examined and controlled if maximum service and dependability are to characterize rubber products.

The object of this article is to review the factors influencing plasticity and intimate the point of view from which the problem of its control might be successfully approached.

Raw Rubbers

When it is realized that no less than a dozen variable factors have a direct influence upon plasticity *in the mixing stage alone*, some idea of the magnitude of the task of controlling this attribute of rubber may be gained. In the first place, raw rubbers, even within the same grade, exhibit great variation in initial plasticity, which is the outcome of conditions, in all probability, that will be outside human control for a long time to come. The mere standardization of masticating and mixing practice, therefore, can never be an insurance against variation in ultimate plasticity.

Briefly it is the amount of work performed upon the rubber that determines its plasticity. If standard and unalterable conditions of milling be assumed it is obvious that the work necessary to produce a smooth plastic batch of rubber on the mill roll will depend upon its condition at the beginning of mastication. This work can be regulated with proper equipment and care. Many manufacturers, therefore, subject their raw gum to heat conditioning during storage, by maintaining a circulation of air at a temperature of about 80° F. If every bale is then allowed sufficient time to attain an equable temperature throughout, all rubber used must at least have the same amount of work performed on it to reach a given increase in degree of plasticity. Thus not only is power consumption economized, but a more equal distribution of mill loading is secured.



Usherwood's Plastometer

1 Circular Base
2 Lower Platen
3 Upper Platen
4 Gage Connecting Rod
5 Gage, Indicates 1/100 mm.
6 Furnace
7 Heating Chamber
8 Window
9 Thermometer
10 Compression weight, 1 kgm.
11 Compression Tube

Since the inherent plasticity of gum as delivered from the plantation may be anything but constant, this preliminary conditioning in storage will have no useful effect as far as regularizing this value is concerned. Accordingly it is common in Great Britain for manufacturers to adopt a system of blending, by which the products of all estates are mixed together in equal proportions before mastication. A test batch is then milled, and the time taken to reach a certain plasticity value is recorded. That time is then set as the standard for every batch milled from that particular blend.

Useful British Innovation

Without careful standardization of mixing conditions, however, these measures would have little benefit; for the condition next in importance is the milling temperature, which itself depends upon a number of variables such as the temperature of the cooling water, the size of "nip" of the rolls, and the initial state of the rubber. If a useful degree of softening is to be derived from premastication, it is essential that the rubber be kept actually cool during the operation.

In this connection a novel method has been introduced by a British

manufacturer, which may not be familiar to many others. As soon as the rubber has become cohesive, it is run in a broad band over a series of rollers, subjected to a cold water spray, dried by means of a draught of air, and so passed back into the mill. The maximum amount of work is therefore performed upon the gum in the minimum of time, without involving the use of elaborate equipment or extra labor, and thus, the virtual capacity of the mill is increased.

Concerning the question of the effect of mill design and adjustment upon plasticity, it is sufficient to remark, that 4 conditions are involved: (a) diameter of rolls, (b) surface speed of rolls, (c) friction ratio between rolls, and (d) distance between rolls. For a standard pattern of machine these automatically become a function of the time spent upon the batch, and the personal equation of the millman. It is apparent that even these 2 factors are related because the first 10 minutes effect the major changes in plasticity, and the subsequent working to which the rubber is subjected depends very largely upon the judgment of the millman.

The chemist, of course, has it in his power to aid the work of mastication by introducing softeners such as stearic acid, pine tar, liquid asphalt, rosin oil, etc., into his stocks at the appropriate stage in the process of milling.

Plasticity Determination

Karrer's quantitative definition of plasticity stresses that "the whole of the deformation is retained." Strictly speaking, therefore, the term as applied to rubber does not connote the quality of being plastic. A truly plastic substance would retain the exact form imposed upon it by an external force, and every rubber worker is familiar, of course, with the recovery of rubber after release of stress. This implies, therefore, the retention of residual elasticity or so-called elastic after effect. Until recently, however, little attempt was made to correlate the 2 components so that no absolute measurement of plasticity, in the sense in which it is applied to rubber, has been accomplished.

The principal methods for evaluating rubber plasticity involve either compression or extrusion. The latter method, though, hardly justifies its use, for the results obtained by it relate to viscosity rather than plasticity. Other methods have been attempted such as measuring the viscosity of rubber solutions or the power consumption of the mill in which the gum is being masticated. The solution method is a reliable guide, but hardly suitable to the rapidity of operation essential to continuous control during manufacture; while power consumption is an index of mobility and can not be accurately followed at all times for every mixing machine especially where operated in line from one shaft.

Probably the system most employed is the compression method of the Williams parallel plate plastometer, which has some disadvantages. A new instrument, however, (see illustration), that permits a measurement of recovery on release of stress, as well as an expression of plasticity as a function of the fundamental properties of rubber, has recently been developed.[1] The platens are circular, one square centimeter in area; and the rubber test pieces are circular cylinders of similar cross section, one centimeter high. The one-kilogram compression weight can be lifted off the sample immediately after the 30-second test period is ended for the recovery time of similar duration then to begin. Heating is applied only to the part of the machine concerned in doing work upon the rubber. The standard micrometer dial gage reading in grades of 0.01 mm. and having a total travel of 10.6 mm. projects above the heating chamber maintained at 100° C.

Plasticity of rubber has been defined as softness, S, multiplied by retentivity, R. The expression giving the value in terms of change of height with this instrument is:

$$P = SR = K. \frac{h_0 - h_2}{h_0 + h_1}$$

where h_0 is the initial height of the specimen, h_1, the height after 30 seconds' compression, h_2, the height after 30 seconds' recovery, and K a constant for a given time and load. Values for P approach unity the softer and less retentive the stock.

With the aid of this plastometer, which can be operated by an unskilled person with very little practice, it is possible to secure an accurate value for the plasticity of rubber in one minute, plus a few seconds for changing samples. The 15 minutes necessary for preheating can, of course, be counted a preliminary in the case of continuous factory control, where the instrument would be in constant use throughout the day. Thus plasticity tests can be conducted with greater rapidity than measurements of cured hardness and specific gravity. By establishing safe tolerances for these values, no greater hinderance of production should result from plasticity control than from any other form of factory control.

Where necessary, the control can be extended to remilled, extruded, and calendered stock. There can be no doubt that the knowledge of the changes being wrought at such stages in manufacture is a guide of the utmost value in facilitating production, reducing burnt stock, and maintaining quality.

[1] "Some Aspects of Plasticity and Its Determination." G. W. Usherwood. *Trans. Inst. Rubber Ind.*, Oct., 1932, pp. 227-40.

Artificial Rubber Wood

Michael Levin

A PROCESS for which a patent has been applied has been developed in the manufacture of artificial wood which possesses properties indicating that it may be substituted for wood in many places. Cellulose waste materials such as corn stalks, sugar cane stalks, and in general materials having a fibrous nature can be used. This new process and product should go far to utilize large quantities of waste materials from the farm as well as from the lumber mills.

A rubber binder used alone appears unsatisfactory; therefore it must be modified to produce a product of a dense hard nature. Some of the tests made with the artificial wood are as follows.

	No. 1	No. 2
Weight per M ¼-inch thick	1,445	1,170
Density (specific gravity)	1.12	.....
Tensile strength per sq. in	1,250 lbs.	2,200 lbs
Transverse modulus per sq. in	3,500 lbs.	3,670 lbs

The density can be controlled as well as the entire operation. The advantage of this artificial wood over natural wood is that it can be molded to the dimension desired. Therefore the product eliminates sawing. On the other hand this product can be sawed, nailed, or glued. It can be painted or coated with metal or rubber. The field is unlimited, and the process and product should serve as a large outlet for rubber as well as the utilization of waste farm products.

W. E. Kline

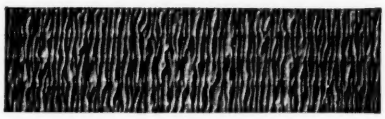
Lillian Bond, Columbia Leading Lady, in a White Brassiere Model Krepe-Tex Bathing Suit with Red Rose and Cap and Shoes to Match

An Open Letter

On Ravishing Rubber Bathing Suits

DEAR GIRLS: I'm all a-flutter! I haven't had such a fashion thrill in years. I mean those all rubber bathing suits. Have you seen them? They a r e pos - i - tive - ly devastating.

The most striking models ever are of Krepe-Tex, a new crinkly rubber that looks like crepe and feels like fabric. The suits are made in 2 styles, fancy scarf effect and brassiere type. They are 2-piece: trunks and the top, which snaps to the former with a button in front. Both tops tie around the waist. But the scarf knots also at the back of the neck; while the brassiere ties in fetching bows on your shoulders. Each style is backless. The trunks open with s n a p buttons on the side.



Unretouched Photograph of U. S. Krepe-Tex

Women's Semi-Sandal

If you want, you can get a short cape to match with a cross-strap effect and snap fasteners. I u n d e r - stand that the United States Rubber Co., which deserves every woman's undying gratitude for these suits, intends to fashion another cape of Krepe-Tex that can serve also as a skirt.

These suits fit like a million dollars and make you look like that too. Krepe-Tex boasts plenty of stretch, and it molds the figure into alluring lines.

Plain rubber, suggesting satin, likewise is used for suits. The scarf model resembles the Krepe-Tex one except that it features wide diagonal stripes instead of triangular inserts. A variation of this style has a collar design of contrasting color.

Speaking of colors reminds me—the swankiest shade this season is "poppy glo." My dears, it is simply divine—a soft orange, from the California poppy, that is so flattering. Another popular color (thank Mrs. Roosevelt) is blue. They and green, each combined with white, make lovely outfits. Solid color suits are available in the Krepe-Tex brassiere style, relieved by a white rubber rose on a green stem, decorating one shoulder. The all white outfit with a red rose will make any man cry, "I surrender, dear." The 2-ply plain rubber suit appears also in conservative black and white. But I defy any one to look conservative in this attire. Canary and brown form another stunning combination for the plain material. You can find a red and white suit too; yet if you wish to be ultra-smart this season, girls, don't flaunt a red bathing suit. The color, though, may be worn for cap and shoes with your all white suit. Remember now; don't say I didn't warn you.

Scarf-Type Suit, Separate Cape, and Riviera Cap, All of Krepe-Tex

All these rubber suits are offered in 3 sizes: small, medium, and large; so you can surely secure your fit.

Now don't let anybody tell you these suits are cold and clammy. Not at all! They are most comfortable, and dry in about 3 minutes after you leave the water. Nor do they become soaked, because the moisture glides right

Riviera Hat

New Rope Sandal

Bathing Cap with Turban Effect Bands

Head Shaped Creation with Contrasting Band and Bows

off; and the color doesn't change either from getting wet. The suits are as light as a feather. When you're in swimming, you'll feel as though you had nothing on; you might be Aphrodite rising out of the sea—and far more fascinating, I'll wager. Naturally with such light weight and lack of restraint you'll swim faster.

With proper care these suits should see plenty of service. To wash them out use plain cold water. If soap gets mixed in, rinse the suit out thoroughly in clear water; for soap and rubber do not agree. Neither do much heat and rubber; consequently don't hang your suit in the sun or near hot pipes; and avoid greases too. In case you accidentally tear your suit, a piece of adhesive on the inside will repair the damage. Anyway when you buy your suit, look on the trunks for the tag bearing the manufacturer's instructions and follow them.

Another thing, don't believe all the stories you may have heard about embarrassing moments and rubber bathing suits, because the latter are suitably reenforced at every weak spot. Besides the seams are machine cemented. Unless, therefore, you abuse the garment excessively, there is little danger of the parting of the ways.

You can purchase caps in colors to match your suits, in Krepe-Tex, plain rubber, or combinations of both. Honestly the marine millinery this year has all the chic of hats for street wear. In fact, Le Monnier, who is a very well known modiste of Paris, designed 2 U. S. numbers: Riviera and Monte Carlo. The former sports a white band finished off with a pert bow and a jaunty brim on the right side that may also be worn to the front, jockey fashion. This hat, like all Krepe-Tex models, is hand made and smartly draped to fit the head. The tucks are "hand sewed."

Monte Carlo, too, is quite attractive. Its distinguishing feature is 2 streamers, one on each side, that may be twisted around the crown or under the chin in several intriguing ways, ending in a dainty bow. Other models utilize contrasting bands and bows in many interesting motifs. The plain Krepe-Tex aviator and diving caps are marketed for you girls who prefer strictly tailored styles. Then the old reliable models of former years have been spruced up.

Oh! You remember my telling you about the Howland, that really watertight cap, the one with the suction cup feature on the inside to keep out water? Well, it originally appeared only in the aviator style; now, however, the company has added the diver cap. It fits way down in the back and has another row of channeling there as extra precaution against cap slipping or water seeping through.

You may not believe it, girls, but bathing footwear is still being bought by the thousands. When you see the new styles, you can readily understand why. A best seller is the new rope sandal with cork and genuine crepe sole. It comes only in solid white and certainly is good looking.

For those of us whose toes and feet are not so pretty, let us offer up a *Deo Gratias* for the modified sandal made especially to cover our defects. The rubber in open woven effect cleverly conceals any corns, bumps, etc., that we may wish to shield from the critical gaze of our public. This sandal has a low heel with cork and crepe rubber sole. The shoe, like most of the others, runs in popular colors to complement the suits.

Can you imagine a bathing slipper that floats? Believe it or not, I discovered one. It is a semi-sandal (I hope by now you realize how important sandals are fashionably) with a sponge rubber sole and a neat ankle strap.

You know, the beach shoes this season have more trim and color and are more attractive than ever, and they suit every taste; for you'll find extreme dress styles, sandal cut outs, trim cuban and low cushion heel styles, and the heelless shoe. So there, what more can you want? If you run around barefoot this summer and get athlete's foot, you'll have nobody but yourself to blame.

Monte Carlo Model

Belts aren't being worn much these days. But if the depression makes you feel you can't afford a new suit (although the rubber creations are very reasonable), I suggest you dress up your old one with a Krepe-Tex belt in braided effect.

I've written so much about this bathing apparel, I've no room for my other news; so you'll have to wait for my next letter.

As for waiting — I can hardly wait for the warm weather so that I can brave the briny deep in my new rubber suit. See you then; and to be in the swim figuratively as well as literally, you'd better have one of these suits.

SYL

Plain Rubber 2-Piece Suit with Collar Effect on Scarf Top

Open Woven Effect Bathing Shoe

Preservation of Latex

Joseph Rossman, Ph.D.

THE following concludes the information on United States patents relating to the preservation of latex, begun in our April 1, 1933, issue.

11. McGavack, 1,699,369, Jan. 15, 1929. This patent is a division of patent 1,699,368 covering the method of preparing stable latex having a pH between 7 and 4.5 using sulphonic alkyl aryl reaction products and formaldehyde. From the description given in the foregoing abstract it will be seen that a new class of stabilizing agent or preservative has been discovered. This class includes the Twitchell type of compound. Stabilizing agents of the kind mentioned in the above examples may be obtained by the sulphonation of aromatic phenols and hydrocarbons, in the presence of unsaturated aliphatic acids. These reaction products may be powder-like or oil-like masses. More specifically, one such stabilizing agent may be made by treating para cresol and oleic acid with sulphuric acid or chlorsulphonic acid. Other types of stabilizing agents comprise aromatic acids sulphonated in the presence of aliphatic alcohols, one illustration of which has been given in one of the above examples. Other materials which may be used to stabilize latex on the acid side of neutrality are the reaction products obtained by condensing aromatic hydrocarbons such as anthracene, naphthalene, etc., with aliphatic alcohols, such as propyl, isopropyl, butyl, amyl, in the presence of sulphuric acid, chlorsulphonic acid, or fuming sulphuric acid.

12. McGavack, 1,772,753, Aug. 12, 1930. Soluble salts of selenious and tellurous acids, such as the alkali-metal salts, when added to latex in small amounts, protect the latex against coagulation. One part of the salt to 1,000 parts of latex will preserve latex over a period of 3 months.

13. Klein, 1,777,646, Oct. 7, 1930. A special apparatus is described for maintaining uniformity in composition of latex dispersions liable to coagulate under the influence of shock or agitation by imparting a general continuous upward movement to substantially the entire body of dispersion contained in a vat by withdrawing the dispersion at the surface thereof and reintroducing the dispersion into the bottom of the vat.

14. Schuster, 1,783,057, Nov. 25, 1930. One hundred parts of latex are mixed, by stirring, with 5 parts of sodium dicresylphosphate. The latex stabilized in this manner shows no tendency to coagulation. The sodium dicresylphosphate may be replaced by salts of other ester acids, such as ammonium diphenylphosphate, potassium methylsulphate, and the like. Other stabilizing substances, such as ammonia, amines, alcohols, etc., may be added besides.

15. Nikitin, 1,801,754, Apr. 21, 1931. The invention comprises adding to latex a small amount of a mono-, di-, or trihydroxy phenol or homologue or analogue thereof, along with a small amount of an aliphatic hydrocarbon such as kerosene or gasoline. The amount of phenol or like body may vary, good results being obtained with 1 or 2 parts in 1,000 parts of latex. Latex so treated will be preserved over a period of months.

Example 1: Two-tenths part of phenol is added to 1 cc. of kerosene, and the emulsified product is then added to 200 cc. of latex. By such a combination latex is preserved over a period of several months or more.

Example 2: If 0.1 part of phenol is added to 100 cc. of latex, the latex is preserved over a period of 5 months.

16. Cadwell, 1,802,753, Apr. 28, 1931. The mechanical stability and filterability of latex is increased by adding sodium undecylenate and cinnamaldehyde to the latex, heating for a short time. The following example is given. A mixture of 100 parts of rubber in the form of ammonia preserved latex, 3 parts of zinc oxide, 3 parts of sulphur, and 1 part of glue is prepared in any convenient manner. To this mixture is then added 1 part of cinnamic aldehyde in the form of an emulsion. The treated latex is then allowed to stand for a time. It will be observed that immediately after the introduction of the aldehyde the mechanical stability, that is the resistance to coagulation, of the latex decreases slightly, but upon further standing the stability shows a marked increase, being doubled at the end of a week and quadrupled at the end of 2 weeks. The rate of deposition of the rubber upon a filtering body, that is the filterability of the latex, increases from the time the aldehyde is introduced and continues to increase upon standing. At the time the aldehyde is added the rate of filtration is doubled, and after a week's standing is tripled.

The introduction of 1% of a soap such as sodium undecylenate to the latex prior to the introduction of the cinnamic aldehyde, will eliminate the temporary decrease in mechanical stability observed in the freshly treated latex. It is desirable to introduce the soap or other suitable stabilizer before adding the aldehyde in order to obtain this immediate increase in stability. The rate of increase can be accelerated by heating the latex for a short time at about 100° C. By so doing it is possible to use the latex within a very short time after its treatment. If, however, it is not desired to use the latex in the manufacture of rubber articles at once, the soap treatment may be omitted, as the stability and filterability will be sufficiently increased by the time the latex is to be used.

Instead of cinnamic aldehyde the following aldehydes may be employed in the same percentage or in larger percentages, say up to 4% on the rubber: butyl aldehyde, heptaldehyde, other poly-carbon aldehydes such as duodecyl aldehyde, benzaldehyde, furfural, salicyl aldehyde, these being representative of both the open chain and cyclic aldehydes, and having more than 2 carbons in connection with a CHO group. The invention may be carried out with equally good results on either ammonia preserved latex or upon vulcanized latex, and appears to be especially adaptable to unvulcanized or vulcanized latices containing a nitrogenous material such as ammonia or an amine. The aldehydes may be added in any desired way, but it will be found that their introduction as emulsions is quite satisfactory.

17. Nikitin, 1,823,119, Sept. 15, 1931. This patent discloses a method of converting stable uncoagulated alkaline preserved latex into a stable uncoagulated acid latex, which comprises treating an alkaline latex with saponin, nullifying the effect of the alkaline preservative, and treating the latex with acid sufficient to impart a pH less than 4.5. The amount of saponin used may be varied and depends upon the acidity desired in the resulting latex, and

the concentration of the latex. Good results have been obtained with from ½ part to 4 parts per 100 parts of rubber in the latex.

As an illustration of the invention, 1,000 cc. of natural latex (about 36% solids) are treated with 2.5 parts by weight of saponin in 10% aqueous solution per 100 parts by weight of rubber in the latex. To the latex is also added 10 to 15 cc. of dilute (approximately 20%) hydrochloric acid. The latex is stable and has an acid reaction. Instead of hydrochloric, any acid, mineral or organic, can be used and added to the latex without danger of coagulation.

When treating ammonia preserved latex instead of natural untreated latex, it is necessary to remove the ammonia or nullify its effects. This result may be accomplished in any of the various ways described in Patent No. 1,699,368, and the saponin may be added prior to, simultaneously with, or after the removal or conversion of the ammonia.

18. Howard, 1,850,673, Mar. 22, 1932. Ammonia present in preserved latex is removed by silica gel. The peculiar efficacy of silica gel is illustrated by the following experiment. Two hundred grams of prepared silica gel were stirred into 1 liter of raw ammonia preserved latex containing about 38% rubber and about 2% ammonia. The alkalinity was measured by withdrawing samples periodically and determinating the pH of the liquid. (A pH value of 7 indicates neutrality; higher values indicate alkalinity; and lower values, acidity.)

Time	pH	Time	pH
Before treatment	11.22	After 6½ hours	9.61
After 30 minutes	10.70	After 24 hours	9.35
After 1¾ hours	9.98	After 7 days	9.30

A similar sample of latex substantially free from ammonia, but containing 0.3% of sodium hydroxide, was treated with silica gel as described above.

Time	pH	Time	pH
Before treatment	10.90	After 5¼ hours	8.03
After 1 hour, 20 minutes	8.80	After 22½ hours	7.90

It is evident that silica gel rapidly reduces the alkalinity of alkaline aqueous dispersions such as rubber latex. It has substantially no effect on the other properties of the dispersion, such as the electrical conductivity, the concentration, etc., and does not induce coagulation. Activated carbon, although somewhat less active than the silica gel, has a similar effect upon the alkalinity of aqueous dispersions.

19. Newton, 1,862,061, June 7, 1932. This patent describes a method of purifying ammonia preserved latex which comprises heating the latex to 80° C. in the presence of a non-volatile alkaline preservative such as potassium phenolate and blowing steam therethrough.

20. McGavack, 1,872,161, Aug. 16, 1932. Latex as received from the tree is treated with 0.2 part of formaldehyde and allowed to stand for about 24 hours; then 0.5 part ammonia is added. The latex so treated produces a rubber having its proteins reacted upon by formaldehyde and is less absorptive to water.

21. Van Heurn, 1,893,477, Jan. 3, 1933. Ammonia preserved rubber latex is vulcanized without substantial coagulation by first adding sufficient aluminum chloride to stabilize the latex against coagulation in the presence of acidic reagents, and adding a thiosulphate salt and hydrochloric acid to the latex to precipitate sulphur in the latex.

Vulcanization of Bicycle Tubes

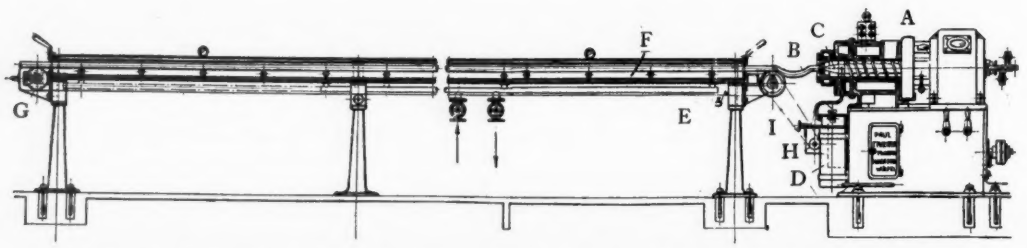
A Process Continuous with Their Extrusion from the Tubing Machine

VULCANIZATION of bicycle inner tubes continuous with their extrusion by the tubing machine has been perfected in Germany after the plan indicated in the illustration. This scheme is rendered practical by reason of the close coordination possible with refined tubing mechanism and modern compounding technique.

The set-up consists of the motor-driven tuber *A*, shown at the right of the picture, from which a tube *B* is delivered from the machine head *C*. At this point the tube is talced on the inside and slightly inflated by a steady flow of hot air from a steam jacketed tank *D*, containing talcum. The tube thus produced is received upon an endless steel conveyer band *E;* the upper portion of which passes through the steam jacketed vulcanizing chamber *F*, while its lower portion returns below and outside of *F*, to the starting point. Power to drive the conveyer is derived from the motor that operates the tuber through the gear and chain drive *H*. The conveyer is maintained at proper working tension by a screw take-up device *G*. Its speed is adjustable by handwheel *I*.

The curing chamber *F* is sufficiently long and its temperature suitably adjusted effectually to vulcanize the tube in the time required for it to be conveyed through its 100 to 130 feet of length. The upper half of the curing chamber or channel can be opened and is provided with several glass windows at intervals of 7 or 8 feet for observation.

The extreme precision with which regulation can be effected as to machine output and its vulcanization renders this combination an important advance as a continuous production unit of marked technical efficiency.

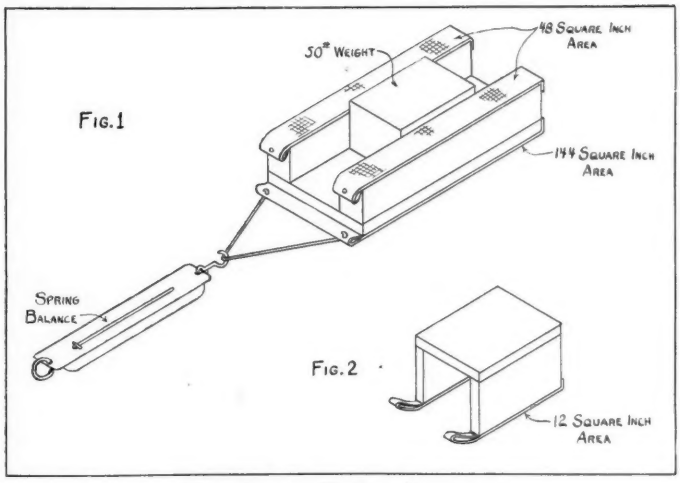


Troester's Machine for the Continuous Production and Cure of Bicycle Inner Tubes

Tire Traction Bugaboo

Albert H. Oldham[1]

AS IS well known, the tire industry has experienced a gradual change from high pressure, small, cross-sectional tires to lower pressure and larger cross-sectional tires. The larger softer tires primarily afford a smoother and better cushioned ride. However, in addition, there appears to be a public acceptance of the thought that the larger tires possess better traction and non-skid qualities. This general belief is shared apparently by many experienced tire men. The purpose of this article is to point out and prove in general the fallacy of the "big tire—more traction" theory when the tires are subjected to usual operating conditions.



Tire Traction Testing Apparatus

Perhaps some of the readers will recall performing a simple experiment back in the physics laboratory in high school or college which consisted in taking an ordinary flat building brick and laying it on its face on a table and pulling the brick along with a spring balance while reading the pull or force required both for starting and continuous movement. The experiment was repeated with the brick standing on edge. Much to your surprise the force or pull required in each case was the same, thus indicating that friction between 2 bodies is constant as long as weight is constant, regardless of surface area in contact.

As a matter of fact any good rudimentary physics textbook dealing with friction, such as Smith or Duff, will contain a statement of the well recognized law which is sometimes expressed as follows: The total frictional resistance is independent of area of contact.

To settle the question from a practical standpoint, however, a series of tests were run with apparatus such as shown in Figure 1.

In Figure 1 the apparatus was designed so that the weight of 50 pounds could be distributed over 144 square inches of mat surface by using the mat faced wooden block with one side down or so that the same weight could be applied to only 48 square inches of similar mat surface by turning the block over. See Table 1 for data obtained.

From the foregoing admittedly crude experiments it will be evident that ordinarily as long as the weight remains constant, the force required to start (static friction) one body sliding over another and the force required to keep the said body moving (kinetic friction) is independent of area of surface contact. In the tests very little difference was found in the static and kinetic readings. However the static was slightly greater in certain instances, and the static readings were accordingly recorded as below.

It will therefore be recognized that in the question of the relative traction qualities of high and low pressure tires as long as the weight carried by each wheel or tire is the same the old high pressure, small cross-sectional tire and the present-day low pressure balloons theoretically and actually possess substantially the same traction and non-skid qualities on hard supporting surfaces.

It is to be understood distinctly that while different mat areas were used, the mat surface was all the same in that the different sized mats were all cut from one large piece having a similarly corrugated surface. It is thus evident that the present article is not concerned with the effect of different tread designs upon the question of traction, which is an exhaustive and treacherous subject in itself.

TABLE 1

50-Lb. Weight Carried by 144 Sq. In. of Crepe Mat Surface on	Lbs. Pull on Spring Balance		50-Lb. Weight Carried by 48 Sq. In. of Crepe Mat Surface on	Lbs. Pull on Spring Balance		Percentage Difference in Spring Balance Pull in Lbs. of Small and Large Contacting Area
	Trials	Average		Trials	Average	
Cement, dry	35-34-31	33.3	Cement, dry	35-32-33	33.3	.....
Cement, wet (water)	31-29-29	29.7	Cement, wet (water)	32-30-31	31.0	4.2 greater on small area
Cement, wet (motor oil)	27-28-26	27.0	Cement, wet (motor oil)	27-27-28	27.3	1.1 greater on small area
Brick, dry	29-27-27	27.66	Brick, dry	28-25-29	27.33	1.1 less on small area
Brick, wet (water)	29-25-25	26.3	Brick, wet (water)	27-24-25	25.3	0.4 less on small area
Asphalt, dry	42-44-43	43.0	Asphalt, dry	42-43-42	42.3	1.6 greater on small area
Asphalt, wet (water)	35-36-36	35.6	Asphalt, wet (water)	36-37-36	36.3	3 greater on small area

As indicated by the tabulated data, all the tests were conducted on solid or non-yielding surfaces: i.e., cement, brick, and asphalt, upon which tires are used the far greatest percentage of the time. The question naturally arises: What is the effect of increased contacting area on yielding surfaces such as mud, sand, gravel, etc.?

TABLE 2

50-Lb. Weight Carried by 144 Sq. In. of Crepe Mat Surface on	Lbs. Pull on Spring Balance		50-Lb. Weight Carried by 48 Sq. In. of Crepe Mat Surface on	Lbs. Pull on Spring Balance		50-Lb. Weight Carried by 12 Sq. In. of Crepe Mat Surface on	Lbs. Pull on Spring Balance	
	Trials	Average		Trials	Average		Trials	Average
Mud (soft)	14-16-17	15.6	Mud	24-29-26	26.3	Mud	32-32-28	30.7
Sand (soft)	37-37-36	36.6	Sand	36-39-37	37.3	Sand	28-26-27	27.0
Cinders	26-28-29	27.6	Cinders	28-26-27	27.0	Cinders	26-28-29	26.0
Grass	38-39-38	38.3	Grass	37-40-38	38.3	Grass	40-38-39	39.0
Concrete	32-34-36	34.0	Concrete	36-35-36	35.6	Concrete	38-34-32	32.7

[1]Patent attorney, Akron, O.

Accordingly a series of tests was run with the same crude apparatus, supplemented by the additional apparatus shown in Figure 2, which applied the 50-pound weight to 12 square inches of contacting surface. The results obtained are shown in Table 2.

From the foregoing it will be seen that a soft, loose, or yielding surface does not react frictionally the same as a hard surface. Thus the first test run on a soft juicy bed of mud indicated that a large contacting area, 144 square inches supporting the 50-pound weight, provided very little frictional resistance. The 144 square inches of supporting surface for the 50-pound weight served to give a toboggan-like support, and there was very little sinking of the mat into the mud. On the other hand when the 50-pound weight was carried by the sled having only 12 square inches of contacting surface, a very decided sinking of the sled into the mud occurred with a materially increased frictional resistance as the sled runners cut down into firmer ground. The results obtained with 48 square inches of contacting surface were, as recorded, between those of the greater and less contacting areas.

It is quite interesting to note that the results obtained on soft sand were directly opposite to those obtained on mud. The 144 square inches of contacting area appeared to give a better support and more frictional resistance than the 12 square inches of contacting area. In the test runs with the 12 square inches of contacting area the 50-pound weight was supported, when at rest, with little or no initial yielding of the sand supporting surface. When the spring balance pull was applied, however, there was a distinct crumbling and yielding of the sand beneath the sled runners which allowed the assembly to be moved initially more easily than the large 144-square inch mat or the 48-square inch mat, but the assembly soon sank into the sand so that the pull required became greater.

The test on cinders, grass, and concrete gave results proving that there was substantially no difference in friction between various sized contacting areas on these surfaces as long as the weight remained the same. The frictional resistance of the cinder surface was somewhat under that of grass and concrete; there appeared to be a rolling action of the cinders under the mats.

Summing up the results obtained on tests run on soft, loose, and yielding surfaces it is immediately apparent that the large contacting areas give a better "snow-shoe" support for the weight carried. This prevents sinking of the weight (or tire) into the yielding surface with a subsequent necessity of pulling the weight not only forward but upward out of the hole formed. While under certain circumstances a better frictional drive and particularly a better braking action could be obtained by using a smaller contacting area and cutting down to a more solid surface (see results obtained on mud test), it is believed this action would be more than offset by the subsequent necessity of pulling the weight and surface out of the hole thus made as set forth just above. Besides the sand test indicated that a large contacting surface gives a better frictional support on certain soft surfaces. It thus appears that on yielding surfaces the large contacting area is best from a theoretical and practical standpoint.

It is, of course, realized that the experiments forming the basis of this article are not extensive and that they have been made to establish general principles only. They have, moreover, been performed with crude apparatus and with the weight supported by each square inch of contacting surface of the similar mats considerably below that supported by each square inch of a tire footprint. But it is believed apparent from the experiments conducted that high pressure, small cross-sectional tires will function to give substantially the same braking and driving action as large cross-sectional, low pressure tires on all non-yielding surfaces upon which 90% of tire use occurs. With respect to soft and yielding surfaces under certain circumstances small contacting areas, particularly for braking, appear best (mud test). However the "snow-shoe" action of the large contacting area plus the indication of the sand test are believed conclusively to warrant the conclusion of superiority of large tires on soft surfaces.

It was originally intended that this article should draw some conclusions as to the relative frictional effects of different kinds of supporting surfaces under various operating conditions. This summarizing, though, is left to the reader to do if he so desires, from a consideration of the data obtained. It should be remembered, however, that the texture of brick, asphalt, cement, concrete, sand, mud, etc., widely varies, as do the compositions, age, etc., of rubber employed in tires or for testing purposes.

In conclusion there is one other matter closely correlated with the question investigated herein upon which some confusion in the trade obtains, and that is the question of tire contacting areas or footprints. There have, for example, been contentions that under similar loads and inflation pressures one tire will make a footprint of a certain area and that a different brand of tire but of substantially the same size will make a footprint of a materially different area. Any allegations of this character are almost always in error; it is well understood that the footprint area of a pneumatic tire is largely determined by the load and inflation pressure. If the load is 800 pounds on the wheel and the inflation pressure of the tire is 40 pounds per square inch, then the contacting area or footprint will ordinarily be approximately 800 divided by 40 or 20 square inches of contacting area.

The theoretical or computed footprint area which would be entirely correct for a thin walled, perfectly flexible tire is, however, always somewhat greater than the actual footprint area of ordinary tires because the stiffness of the tire carcass serves to carry some of the load. The actual footprint area is approximately 5% to 20% less than the computed area, depending upon the stiffness of the tire carcass, the build-up of the tread at the shoulders of the tire, and the cross-sectional contour.

However the variation in footprint area of approximately the same sized standard tires of the best known companies, when loaded to the same weight and with the same inflation pressures, is seldom over 5%.

Regardless of the assertions of the various companies as to tire footprint areas, it is to be noted in view of the conclusions arrived at in the main body of the present article that even if a real difference existed in footprint area, the frictional drive and braking action of the tire is substantially independent of contacting area on solid surfaces where 90% of tire use takes place.

Acidseal Paints

PROTECTION of iron and steel tanks and steel structural work, pipe lines, and machinery has been greatly facilitated by the introduction of rubber derivative paints developed by the Goodrich laboratories. These paints have as a base a commercial form of a rubber isomer which imparts to the paint film certain valuable properties not found in ordinary paint films. They possess exceptional properties of adhesion when applied to a properly prepared surface. The bond between the paint film and the surface is practically integral. The paints dry in an hour to a hard film, but retain the elastic properties of rubber and conform to the expansion and contraction of the support. These paints provide a coating that minimizes the corrosive action of acids, alkalies, and chemical fumes.

Latex Compounding Apparatus

Concentrating and Compounding Latices or Rubber Dispersions

A METHOD and apparatus of recent invention[1] relates to the concentration or compounding of liquids liable to skin formation, frothing, or sedimentation. The liquids may be latices or dispersion of rubber and similar vegetable resins, for instance dispersions of rubber, gutta percha, and balata in a vulcanized or unvulcanized condition and containing stabilizers, fillers, reenforcing agents, accelerators, coloring matters, preservatives, softeners, or anti-agers.

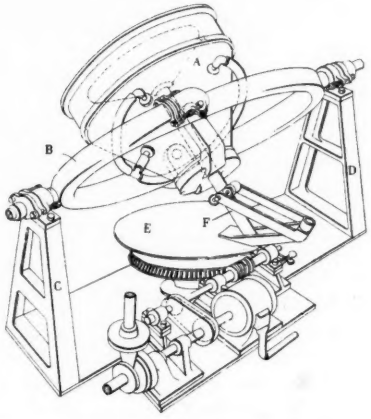


Fig. 1. Perspective View

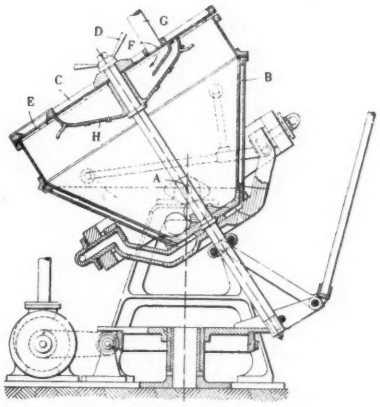


Fig. 2. Vertical Section

Latex Concentrating and Compounding Machine

The concentration or evaporation is carried out concurrently with compounding in such a way that the dispersion of the compounding ingredients is facilitated, enabling compounding ingredients to be uniformly distributed throughout the liquid without premature coagulation, thereby producing a smooth concentrate of cream-like consistency.

The apparatus is represented in perspective in Figure 1. It comprises a steam jacketed vessel *A* of cone shape mounted with a circular yoke *B* in gimbal bearings supported on standards *C* and *D*. Bodily revolution of vessel *A* is effected by a driving bracket which is shown in the form of a table *E* rotatable on its vertical axis and formed at its edge to engage the free end of an inclined rod or shaft *F* attached to vessel *A*. The bodily revolution of the shaft *F* about the axis of the table *E* is accommodated so as to effect the desired universal oscillation of the vessel *A* about a central point within it with the aid of the gimbal or universal joint structure mentioned.

A vertical section of the apparatus is shown in Figure 2, wherein the center of oscillation is located at point *A*. In this figure the steam jacket is shown at *B*. The cover *C* of the vessel is held in place by a wing nut *D* and is provided with an inlet *E* for charging material into the vessel, and a second inlet *F* with flexible pipe connection *G* to allow entrance into the vessel of hot air forced into it by a circulating fan not shown. Distribution of the hot air is by means of small openings through the conical chamber *H* on the under side of the cover *E*. Escape for the hot air and the vapor is through a space around and under the cover, which is kept from sealing the vessel tightly by means of blocking spaced at intervals around the edge. The vessel is hand tiltable for emptying.

In operation, the desired amount of compounding ingredients is mixed, to form a thin cream, into a quantity of water containing, if desired, dispersing and stabilizing agents in solution. This may be done separately or in the apparatus. If separately, the cream is placed into the vessel together with the latex, or if in the apparatus the latex is added, and the apparatus is set in motion, its rocking or oscillation is sufficiently gentle to preclude foaming or trapping of bubbles.

The apparatus being in motion, the air or gas is introduced into the vessel and hot water is admitted to its jacket. The temperature of the liquid to be concentrated is preferably not allowed to rise above 70° C. Treatment, concurrent concentration and compounding, is continued until the desired degree of concentration, of which the viscosity provides a convenient index, is almost attained. Vulcanizing agents are then added in dispersion form, and treatment is continued a short time until the mixture has the desired degree of concentration.

During these processes the motion of the vessel provides the required gentle continuous dispersive agitation and the continual exposure of fresh surfaces to evaporation. The particles of the compounding ingredients are evenly distributed and uniformity of the mixture is effected so that a concentrate results which from its creamy consistency and from the processes effecting its formation inhibits subsequent separation or agglomeration of its components.

The air or gas current is then ceased, and cold water in place of hot is circulated through the jacket of the vessel until the temperature of the mixture is reduced to less than 25° C., the motions of the apparatus still continuing, to obviate skin formation. During the cooling stage ammonia may be added, if desired for the adjustment of the relation of the viscosity and the concentration, and finally the mixture is discharged and, preferably, strained.

By the process outlined a wide variety of concentrated mixing can be made utilizing a wide range of compounding ingredients and a variety of stabilizers.

[1] U. S. Patent No. 1,898,604. Feb. 21, 1933.

A MILL-MAN WAS WARMING UP A BATCH AND NOTICED A ticket in the stock. Instead of stopping the mill, he tried to grab the ticket while the mill was running, but his hand was drawn into the rolls. He pulled the safety; the mill stopped instantly; and only the tips of his fingers were injured. *News Letter,* Rubber Section, National Safety Council.

EDITORIALS

An Unwarranted Bill

THE Black bill, which provides a 30-hour, 5-day week for industries other than agriculture, newspapers, periodicals, and railroads, has passed the Senate, but was prevented from going to the House by a motion for reconsideration.

If this bill eventually becomes a law, it will arbitrarily debar from interstate commerce the products of industries in which persons are employed for more than 6 hours a day or 5 days a week.

Rubber products for the greater part are manufactured by continuous processes with 3, 8-hour shifts as a rule. Splitting up the hours with a 6-hour, 5-day week would result in added labor cost of more than 20%, and a decided increase in unemployment.

How can Akron, Ohio, compete in the national sale of tires if the Black bill is placed on the statute books? And the rubber industry would be at a sad disadvantage in competing with foreign rubber manufacturers.

It is doubtful that the bill will ever pass the House, as it is said to be unconstitutional and quite too revolutionary for the present Congress to consider.

Perpetuate the Rubber Division

THE Department of Commerce in Washington is earnestly striving to meet the insistent need of economy in governmental business, and the abolishment, has been suggested, of the commodity divisions including rubber, and also many of the district, cooperative, and foreign offices. As the result, a committee of publishers of industrial trade journals has been appointed by the Secretary of Commerce to appraise the benefits to industry of these governmental branches and ascertain to what extent economy can be practised without curtailment of their essential activities.

It would indeed be a serious loss to the rubber industry should the Rubber Division be abolished and its efficient staff of specialists scattered. The cost of functioning this department is extremely small in proportion to the value accruing to the industry through the division's foreign and domestic statistical service.

Accurate figures covering world rubber production, rubber absorption, and principal world stocks are regularly available—information of the greatest importance to an industry entirely dependent on foreign sources for its supply of basic crude materials.

Reliable foreign trade statistics are issued regularly by the division and comprise a monthly summary of trade with the principal nations of the world, comprehensive statements of United States exports and imports of various manufactured rubber goods, and numerous bulletins relating to trade with foreign countries.

Of inestimable value to rubber manufacturers are the special surveys conducted by the division, such as the annual surveys of United States crude and reclaimed rubber consumption, also the semi-annual surveys of dealers' stocks of rubber tires, rubber footwear, and the research investigations regarding rubber production and tire renewal sales, all of the greatest aid to both the rubber and automotive industries.

Therefore we believe the Rubber Division should be perpetuated as the source of statistical information without which this country's rubber industry would be greatly hampered.

Small Manufacturer

THE predominance of small manufacturing companies in the United States is indicated by the statistics supplied by the 1929 Biennial Census of Manufacturing showing that 99% of manufacturing plants in this country employ less than 500 persons. These companies are withstanding the economic depression better than the larger ones because they are less unwieldy and complex in organization. They have less red tape, thus permitting the advantages of closer executive control of sales and manufacturing operations, effective team work guided by concentrated authority. The small plant manager must be resourceful, alert, and aggressive toward merchandising and manufacturing problems. His success is therefore a matter of managerial ability and foresight. The present low prices of crude rubber, fabrics, and compounding ingredients, which are purchased in hand-to-mouth lots, are all to the advantage of the small rubber manufacturer.

Apart from a few large manufacturing organizations the rubber industry comprises only small companies equipped for making standard or special products in which the properties of rubber are utilized in an endless variety of applications.

The possibilities of rubber manufacturing in small plant operations are being enlarged both within and without the rubber industry by the rapid developments of latex technology. In this respect the small plant rubber works manager will do well to consider the versatility of his material and seek to extend its use in new fields.

What the Rubber Chemists Are Doing

A. C. S. Rubber Division Meetings

Boston Group

THE Boston Group, Rubber Division, American Chemical Society, and the Northern New England Section, American Association of Textile Chemists and Colorists, held a joint meeting April 6, 1933, at the University Club, Boston, Mass. The attendance comprised 100 rubber and 30 textile chemists. The rubber group elected as officers for the current year Bradley Dewey, chairman, and J. J. Sindler, secretary-treasurer.

Preceding the reading of technical papers John A. Seaverns, a well known consulting chemist of Boston, spoke briefly on misleading and exaggerated claims on the part of manufacturers regarding their products, and the readiness with which the unscrupulous seek the aid of chemists to analyze high class chemical products for the purpose of appropriating the manufacturing formula of the original.

E. M. Hayden, technical director, Stanley Chemical Co., East Berlin, Conn., in his paper, "The Uses of Lacquer in the Rubber Industry," outlined the use of lacquer for the protection and ornamentation of wood and metals and the extension of its use on those products of the rubber industry where brilliancy of color and finish enhances sales. Lacquers are now being used successfully in the rubber trade on fabric topping, rubber shoes, tires, balls, dolls, toys, and other novelties.

A clear lacquer consists of 4 components: (1) nitro-cellulose; (2) plasticizers; (3) resins; and (4) solvents. These items function as follows. The nitro-cellulose serves as the lacquer base; the plasticizer, commonly castor oil, contributes flexibility; resin, natural or synthetic, supplies surface glaze; and the solvent furnishes the liquefying vehicle.

The properties essential to lacquer for application to rubber are great flexibility and strong surface adherence. Lacquers are of 2 sorts, continuous and non-continuous film. The first is not quite so dry as the second, but is stretchable and can be applied to rubber either before or after vulcanization. Non-continuous film lacquer is a clear lacquer pigmented. It is applied after vulcanization and gives a brilliant dry coating of any desired color.

In the concluding paper of the meeting S. G. Byam, Rubber Chemical Division, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., discussed "Problems of the Proofing Industry," encountered by both the textile colorist and the rubber chemist. The harmful effect of copper and manganese was indicated. The latter element is more devastating in its action than copper. However both must be guarded against by the proofer despite improved aging obtained with antioxidants. The harmful effect of copper cannot be eliminated by the best antioxidant. An amount of 0.002% copper in a fabric may be safe enough if a good rubber compound is used, but aging is better if no copper is present.

The control of bloom lies in the sulphur-accelerator ratio, hence the tendency of low sulphur and high accelerator cures. If used in excess waxes and antioxidants will migrate to the surface and cause a bloom. "Frosting" is another type of bloom due to surface action of acidic accelerators. Its elimination can be accomplished by using certain secondary accelerators and antioxidants with the acidic accelerator.

Sulphur chloride cure is reasonably good for thin coatings. It is easy to handle and may be applied by passing the fabric continuously through a closed chamber containing sulphur chloride vapor.

Most rubberized fabrics are without odor if made with proper materials and curing methods. There are exceptions which give rise to the need of using deodorants and reodorants.

A future problem of the proofer will come with the use of DuPrene instead of rubber. DuPrene handles much like rubber. Its characteristic odor entirely disappears in a spread dry-heat cured fabric.

Chicago Group

THE Chicago Group, Rubber Division, A. C. S., held a meeting Friday evening, April 28, 1933, in the College Inn, Chicago, Ill.

J. Kirschner, chief chemist, The Dryden Rubber Co., Chicago, presented a paper on "Cracking of Rubber When Exposed to Atmospheric Conditions." This paper was illustrated, and the strong and weak points of the formulas regularly used in the industry were discussed in detail.

Thomas Wolf, district traffic manager, United Air Lines, spoke on "The Application of Rubber to Aviation." The paper was illustrated by a moving picture narrative of a flight from California to New York. This meeting was one of the most interesting and best attended gatherings of the Chicago Group.

New York Group

THE New York Group, Rubber Division, A. C. S., will hold its next meeting on May 5 at the clubrooms of the Building Trades Employers Association, 2 Park Ave., New York, N. Y. Tickets for the dinner, which includes an interesting program of papers and light entertainment, may be secured at $2 each from the group treasurer, Peter P. Pinto, 250 W. 57th St., New York. The scheduled papers are "The Effect of Oils and Various Chemicals on DuPrene Compounds," Ernest Bridgwater, E. I. du Pont de Nemours & Co., Inc.; "Commercial Uses of Rubber, Thiokol, and DuPrene with Oil and Solvents," W. L. White, Raybestos-Manhattan, Inc.; and "Antics of Electrons," O. H. Caldwell, editor of *Electronics*.

Dustless Micronex

MORE than 5 years ago Dustless Micronex pioneered in the field of dense, non-flying carbon black in pellet form. This product has always been prepared from carefully controlled standard Micronex processed to produce a special form which practically eliminates the difficulties incident to flying and dusting. The manufacture is protected by a patent background.

The original Dustless Micronex always commanded a higher price than compressed black because extra processing is involved. Recently the process has been further improved, and economies have followed the larger scale manufacture of this special type, which has all the advantages of a standardized grit-free black especially designed for rubber compounding, plus the advantages inherent in the pellet form for certain mill room conditions.

The original Dustless Micronex consisted of a pellet of approximately $\frac{1}{16}$-inch diameter formed of a mass of porous Micronex. These smooth, well rounded aggregates, although sufficiently compact to maintain their form under shipping and handling conditions, are shown by the microscope to consist of a spongy, porous mass. This is readily broken up by shearing action and is therefore equally as dispersible as compressed black by either roll mill or the conventional internal mixer.

Dustless Micronex now differs from the original only in the size of the aggregates which has been reduced very materially from the original diameter. It is to be particularly emphasized that this carbon black differs from standard only in physical form and that it retains unimpaired all of the reinforcing and toughening properties of Micronex. The name, Dustless Micronex, is still maintained since it is already favorably known, and the newer form is produced under the same issued patents.

Compounding Latex Paints[1]

IN THE manufacture of latex paints, the difficulty is to obtain perfect dispersion of the pigment in the latex without coagulation. If fine powders are mixed with the latex without the necessary precautions, they cause coagulation; and the finer the powder, the more rapid the coagulation. Also if the latex is added to the powder, coagulation takes place more readily than if the process is reversed. Coagulation is not prevented by diluting the latex unless the rubber concentration does not exceed 2%; nor is the difficulty overcome by violent agitation. In nearly all cases tests have shown that where the pigment and latex were mixed in a colloid mill, coagulation was caused by the repeated friction of the rubber particles against the sides of the mill.

Sometimes a perfect mixture may be obtained with a small amount of latex, but when more latex is added, coagulation results. Finally a mixture may appear to be homogeneous, but actually contain a suspension of powder and extremely small clots of coagulated rubber.

These difficulties, can be avoided by adding to the latex a suitable anti-coagulant, as a solution of caustic soda, sodium carbonate, or ammonia and a protective colloid. The pigments should be separately ground in water to a paste and then added gradually to the latex. Even then certain pigments are difficult to incorporate and must also be mixed with some protective colloid as soap, glue, gelatine, or casein. This is especially true of carbon black, zinc oxide, and to a lesser degree, magnesia and magnesium carbonate. Thus a thin paste or carbon black in a 10% soap solution, for instance, can be added to latex without danger of coagulation. Because of the adverse effect of certain metals and their salts on latex—copper, bronze, brass, etc., apparatus used in treating latex should not be made of these materials.

The following formula for making latex paint is suggested. The vehicle is 4.5 liters of ammoniated latex to which are added 225 grams of casein and a few grams of Preventol, a protective antiseptic for the casein.

The pigment paste is prepared separately of 1.8 kilos of pigment, about 1 liter of water, 0.125-liter of linseed oil, and a few grams of an emulsifier. Vehicle and pigment paste are then mixed together.

The paint may be applied by brush or spray-gun and is said to be superior to those obtained from an emulsion of oil in water. A 60% latex should be used, and if a vulcanized product or one containing vulcanizing agents is used, a film is obtained which dries in 1½ hours. The only disadvantage of this paint is that it gives a somewhat dull surface. This feature is one that will doubtless be overcome as the result of experimental studies of the problem now in progress to cause the paint to dry with a glossy surface and thus enlarge its field of application.

[1] *Rev. gén. caoutchouc*, Feb., 1933, pp. 18-19.

Determining Dirt in Crude Rubber[1]

A. V. Aphanassiev

CRUDE rubber for the rubber industry should be practically free from such foreign matters as sand, earth, woody fibers, etc. The determination of these impurities is very important especially in rubber obtained from herbaceous plants or shrubs such as guayule, tau-sagyz, and chondrilla.

The method here proposed permits rapid determinations of the dirt content in the various grades of rubber and requires only a small sample of the material. In addition to the estimation of dirt it is indispensable to make a determination of the ash as a portion of the mineral salts in the ash may dissolve in industrial solvents.

Determination of Dirt

Weigh approximately 2.0 gr. of rubber cut in narrow strips into a 500 cc. Erlenmeyer flask. Add 200 cc. of kerosene and place the flask equipped with reflux condenser on the sand bath. Boil one hour. A more prolonged boiling is not recommended because it may hinder the subsequent filtration. Prepare a Gooch crucible for filtration in the following manner: asbestos, previously digested with alkali and nitric acid, is placed into the crucible and washed in succession with water, alcohol, and acetone. Then the crucible is placed into the thermostat kept at 90 to 100° C. and dried. Filter the hot solution with suction through the weighed Gooch crucible. Make successive washings with hot kerosene, benzine, alcohol, and acetone. The washing with acetone must be continued until the liquid is free from color. Dry the crucible to constant weight. Subtract the weight of the crucible with dirt from that of the crucible with asbestos only. The difference represents dirt, which may be calculated in % on analyzed rubber.

Total time required for the determination is not more than 2 hours. By igniting the dirt in the Gooch crucible, ash not dissolved in the used solvents is obtained. This method is suggested as an essential addition to the generally accepted methods of crude rubber analysis.

[1] The procedure given is an abstract from the author's paper "Methods of Evaluation of Crude Rubber." *J. Rubber Ind.*, Moscow, Nos. 3 and 4, 1932.

Wetting Power

Appreciation of the importance of the wetting power of compounding ingredients is increasing in the rubber industry. The result of improving particle size to improve wetting power of compounding powders is well exemplified in Hakuenka, an isomer of calcium carbonate (whiting) in which the colloidal calcium carbon content is 42.21%. In rubber mixings this gives higher tensiles, acid resisting power, and greater ease of mixing on the mill.

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Igepon A

The wetting agent Igepon A is a fatty ester of a sulphonated fatty content. It belongs in the general group of the sulphonated fatty alcohols and is used to reduce surface tension and thus facilitate the impregnation of fabrics by latex.

New Machines and Appliances

Horizontal Bias Cutter

BIAS cutting of rubber coated fabric is an essential preparatory step in the manufacture of tires and hose. The latest improved machine for this purpose is represented in the plan view below.

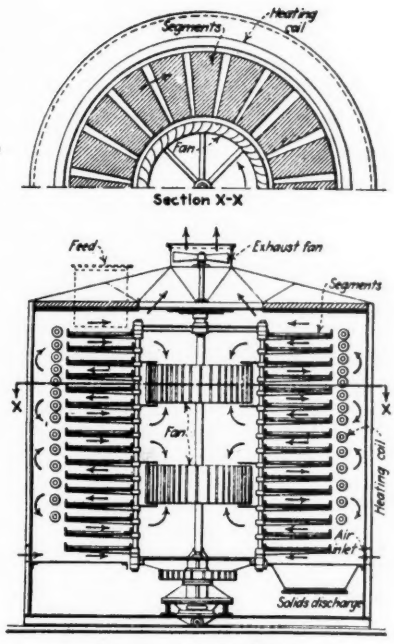
The machine is very simple in construction and incorporates many new features. It is hydraulically driven and will cut from ¼-inch strips up to 40-inch widths on any angle. It can be operated either to cut a given width continuously, or the cuts may be varied so each is of a different width. The speed of the machine is approximately 45 cuts per minute. It is entirely self-contained, absolutely accurate, and requires but one operator.

Another feature of particular importance is that after the plies are cut they are carried on a conveyer so that they are spaced, which permits very easy handling. The machine is particularly adaptable for either indirect production or direct fabrication methods, and, because of its marked simplicity, assures very low maintenance outlay. Spadone Machine Co., Inc., 122 E. 25th St., New York, N. Y.

Turbo Drier

THE new type of drier here shown is one of several developed in Germany to meet industrial drying needs. The method of conveying the material through the drier is a radical departure from those in ordinary practice and is especially suited for handling such stock as ground reclaim or powdery material of any kind, as well as products which in the wet state have a pasty consistency. For drying from slurry a special type employing a wire belt is used.

Referring to the illustration, wet material charged into a receiving hopper, is delivered by a special feeding device onto the uppermost trays, which form an annular shelf with small radial gaps. As the trays rotate, they pass under a stationary spreader, which layers the material to a predetermined thickness. The gaps in the next annular shelf below are staggered with respect to the gaps in the shelf above so that any excess material from the trays above will drop on the trays immediately below and no further. After each tray makes one revolution the material is wiped off automatically and dumped onto the tray below. This transfer turns the material over and exposes a new surface to drying. When the dried product reaches the discharge end, it has been turned over 20 to 40 times according to the size of the drier.



Buettner Turbo Drier

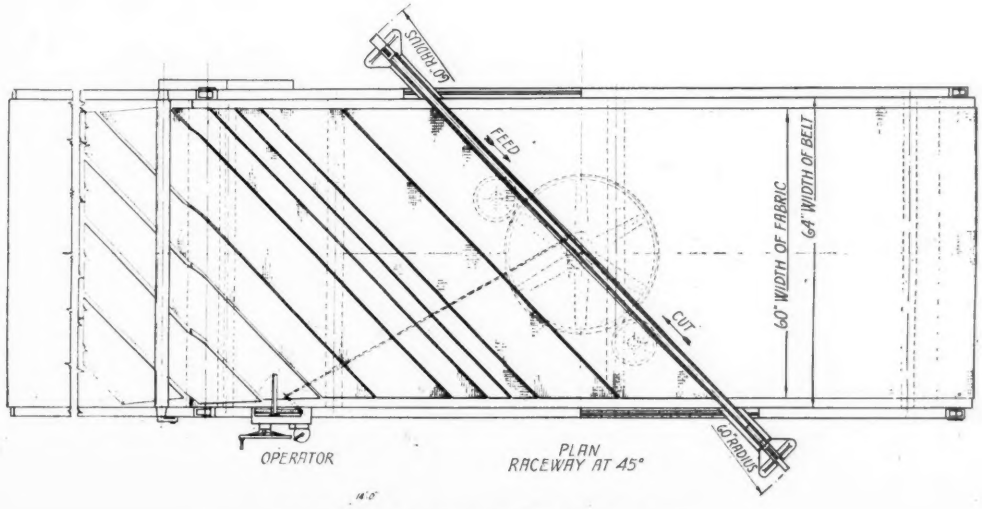
This method of conveying the material, together with the improved method of air circulation, accounts for a remarkably short drying time and uniform drying performance. In addition there is no dust problem since whatever dust is picked up by the air in the lower section of the drier is deposited by the air moving in counterflow onto the wet material in the upper section.

The efficiency of the new drying principle employed is reflected in its unusually low power and steam consumption. In addition it permits close control of the drying with respect to temperature and moisture content, most essential when drying very sensitive products. Arnold Weisselberg, 32 Kensington Ave., Jersey City, N. J.

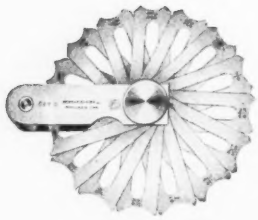
Fillet and Radius Gages

SOME very unique features are embodied in a series of fillet and radius gages here pictured.

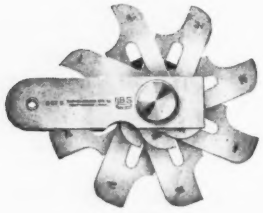
Concave and convex radii of the same size are included on the same blade. This double-ended feature reduces by ½ the number of blades necessary for a given range. The blades are long and easily used in places formerly hard to reach. They are slotted and slide easily. This slotting feature makes many blades available at one time. A large clamp nut locks the blades securely in any desired position. Lightweight metal is used, which gives greatest possible lightness with strength.



Plan of Spadone Horizontal Bias Cutter



No. 627D



No. 627B

Fillet and Radius Gages

Long, sliding blades make these tools very easy to use and handle. Each gage has but half the usual number of blades for a given range; the desired size is found quickly. Practically all the blades can be extended at one time—a further convenience. Blades are hard rolled steel and can be clamped securely. They are about twice as long as usual blades and are double-ended. Brown & Sharpe Mfg. Co., Providence, R. I.

Hose Ferrule Crimper

THE ferrule crimper pictured is adapted for the attachment of couplings to air, water, or garden hose, taking up to 1½-inch ferrule with crimper dies available for any size of ferrule.

The crimper is placed in a vise, as illustrated, the hose end with coupling and ferrule inserted in the jaws of the die. The tightening of the vise jaws crimps the ferrule at once, tightly and permanently. With this device garden hose can be coupled in lengths desired from reel lengths and used hose can be recoupled as required. Dill Mfg. Co., Cleveland, O.

Boiler Feed Unit

THE improved boiler feed unit here shown is designed not only to pump feed water against high boiler pressure in gas fired steam boilers to maintain a constant water level, but it will also return condensation to the boiler and supply make-up water as required. It also assures maintenance of a constant water level without fluctuation of the steam pressure. Special features of this automatic unit follow.

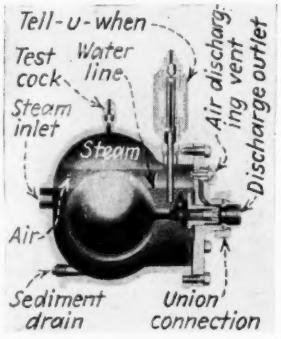
A new and efficient, high speed motor driven turbine pump replaces the old style tandem pumps. A new flat head, supporting valve and float for make-up water control, is used in place of the former larger and more cumbersome device.

Angle iron supports are bolted to brackets welded to the tank to make a stronger, more compact, and neater job, requiring less floor space. Mears-Kane-Ofeldt, Inc., Philadelphia, Pa.

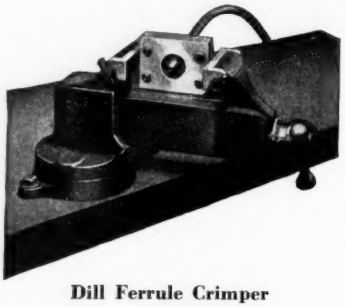
High Pressure Hose Clamp

"KING" double bolt malleable iron clamps and anchor bars, shown in the accompanying illustration, are especially desirable for high pressure and discharge hose. The "King" double bolt clamp firmly embeds the hose into the grooves of the nipple, and the arrangement of the one band fitting groove on the outside of the nipple and anchored to the "King" double bolt clamp prevents the nipple from blowing out of the hose.

A set for one end of the hose consists of one clamp to fit the groove on the nipple at the end of the hose, 3 "King" double bolt clamps, and 2 anchor bars.

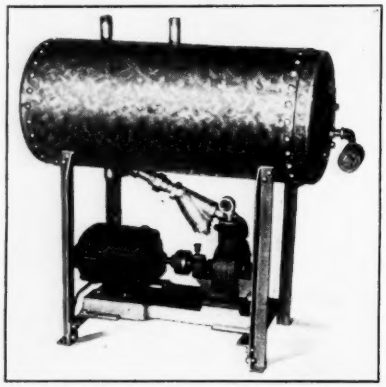


New Swendeman Trap

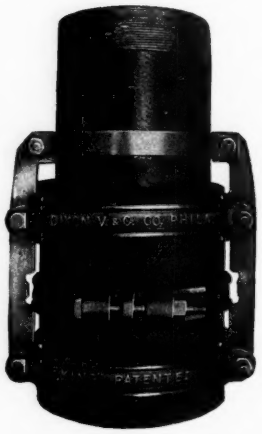


Dill Ferrule Crimper

Spun Steel Grease Hose



Automatic Boiler Feed Unit



"King" Hose Clamp

Dixon Valve & Coupling Co., Philadelphia, Pa.

Steam Trap

THE steam trap pictured in sectional view presents 3 new features of special interest and importance. These are the Tell-U-When, which indicates at a glance if the valve is wire drawn and wasting steam; the Air Vent that continuously discharges air as it comes into the trap and prevents the trap from becoming air bound; and the Union Connection which permits replacing valve and seat in 3 minutes. The strong balanced design, the easy access for examination and repair, the correct proportioning, and the heavy mass of metal in the frame that will not spring, all make for long life, economical operation, and perfect alinement of parts despite high pressures. J. E. Swendeman, Inc., 171 Camden St., Boston, Mass.

Grease Hose

THIS hose is classed as high pressure since it is guaranteed to withstand an internal pressure of 12,000 pounds per square inch. Strength to support this excessive pressure is due to the unique method of construction employed. This consists of a ¼-inch central tube of composition specially resistant to oil or grease. Over the tube are spun spirally, not braided or woven, 4 layers of steel wire. Of these layers number 3 and 5 are spun in reverse direction to layers 2 and 4. Each layer is completely embedded in rubber. Over the wire plies are also spun 2 plies or layers of long staple cotton spiraled in reverse direction each to the other and each embedded in rubber.

Maximum durability is secured by an overall steel armor casing through which oil or grease cannot penetrate; while it protects the hose against rough usage. Special armored tube couplings are applied to the hose to guard against its injury by sharp bends. Their method of application prevents any damage to the hose itself; yet it is so positive that the couplings cannot leak or blow off. Armored Tube Co., Box 4, Malden, Mass.

New Goods and Specialties

New Vanitex Product

Brewers' Rubber Apron

THIS product satisfies the wants of so many jobbers for a quality apron for car washers, battery men, and brewers. It is black, waterproof, and acidproof. Although a heavy duty apron, it weighs only 2 pounds 6 ounces as the rubberizing is done with pure rubber and is not loaded with fillers to give it body and thus add unnecessary weight. This double-coated apron is made from a closely woven, smooth cotton drill of great strength. The finish of the rubber is smooth and velvety and free from lumps or imperfections. All hems are cemented, and corners mitred. Strong, rustproof eyelets at reenforced corners will, it is claimed, not pull out.

A lighter weight and sized apron is also made, especially for factory workers, chemists, florists, and others who need protection from liquids, acids, etc. It weighs only 12¾ ounces, but has all the other features of the heavier model. Van Cleef Bros., Woodlawn Ave., 77th to 78th Sts., Chicago, Ill.

Rubber Dishes

FOR all these dishes and similar vessels and receptacles the inventor selected rubber, a flexible and resilient liquidproof composition, because it particularly lends itself to this purpose as it is capable of being compounded to furnish the required flexibility; furthermore this material is liquid- and waterproof and can be easily kept clean.

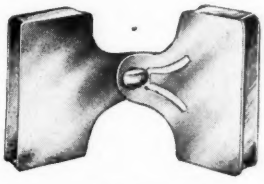
Such dishes are especially desirable for children's service. They are practically unbreakable; thus they not only eliminate losses from breakage, but in addition they avoid the attendant danger of broken fragments inflicting injury. Besides the novelty of rubber dishes will appeal to children, thereby assisting their parents in urging them to eat.

Again, it will be found that such dishes are useful for camping trips, picnicking, on shipboard, and the like. With reference to their suitability for such purposes, it may be pointed out that they can be packed or compressed into small space, and danger of breakage is eliminated. They are particularly suitable as a traveler's cup; for they can be folded and inserted into a packet or handbag, as they will reassume their normal shape or form after having been subjected to bending or twisting. They can be utilized for various forms of dishes, platters, mixing bowls, etc.

It is claimed that these rubber receptacles do not change the taste of food. The rubber is made of fast colors with attractive designs pleasing to little ones. It is said to be tasteless and non-poisonous. John H. Doak, inventor, Box 131, Multnomah, Ore.

Rubber Fly Swatter

THE old-style straight-edge wire fly swatters have many disadvantages. Unless the swatter was hit flat, the fly escaped; yet furniture and woodwork were often marred. Now, however, comes a rubber fly swatter, the Corner Clipper, that eliminates these objectionable features. Because it boasts 20 rubber switches on its end, this swatter can catch its victim in corners, around edges, and in hard to get places. Being of soft, flexible, and durable rubber, it will not tear curtains or other fine materials and it will not scratch furniture or woodwork. The Corner Clipper is made in red, green, or black rubber. The handles come in 2 styles: all wire or with a wooden end in colors to match the rubber swatter. Seiberling Latex Products Co., Akron, O.



Patented Gilmer Buckle

Gilmer Utility Bag and Cushion

Corner Clipper Swatter

Three in One Bag

THE Gilmer Three in One Bag combines in one bag 3 distinct uses, as follows, especially adapted for motoring, camping, bathing, and canoeing. Inflated, this bag is a cushion for easy riding or to add height; it is a back rest or pillow when camping, sailing, boating, canoeing, or about the house. Inflated, the bag is also a dependable, practical float to support the body in water when learning to swim. Held securely on the back of the wearer by an adjustable strap, it does not interfere with arm movements. Deflated, it becomes a spacious carry-all or utility bag, quickly opened and closed by a slide fastener. Sheet rubber lining prevents dripping of water from wet bathing suits. Its handles make it convenient to carry. A cover of smart blue or red plaid adds an attractive appearance.

Two Gilmer single movement rustproof buckles link the adjustable strap securely to the bag with a positive lock. A snap of these patented buckles quickly removes it from the wearer.

The bag is easily blown up by the mouth and is quickly deflated when desired. A turn of the thumb screw opens or closes the valve; there is no cap to lose. L. H. Gilmer Co., Tacony, Philadelphia, Pa.

Rubber Industry in America

OHIO

Goodrich Activities

New office hours of 7:45 A.M. to 4:30 P.M. went into effect at The B. F. Goodrich Co., Akron, on April 17, to continue throughout spring and summer.

P. C. Handerson, Goodrich advertising director, returned to Akron on April 5 after a business trip on the Pacific Coast.

William S. Zimmerli, formerly staff member of the Goodrich tire division, visited Akron before sailing for England on April 20 where he will represent du Pont interests abroad. Dr. Zimmerli left Goodrich several years ago to join E. I. du Pont de Nemours & Co., Inc.

On April 12, Burt F. Stauffer's appointment as general manager of The Miller Rubber Products Co., Inc., division of the Goodrich company, was announced by J. H. Connors, Goodrich vice president and general manager of the mechanical division. Mr. Stauffer, who recently celebrated 40 years with the company, succeeds R. T. Griffiths, who assumes other duties. The former had been assistant general superintendent of the mechanical division since 1925.

The Worthington Ball Co., manufacturer of golf balls, Elyria, has announced a new line, the new "Tommy Armour" golf ball.

The Firestone Tire & Rubber Co., Akron, through President John W. Thomas, has announced another reduction in tire prices, dated March 21. The company will not eliminate any of its 4 lines, contrary to the policy of the other members of the Big Four.

The Goodyear Tire & Rubber Co., Akron, has a new director, Thomas H. White, chosen at the recent annual stockholders' meeting to succeed J. Arthur House. President Paul W. Litchfield is the only candidate for director of the Fifth Election District of the National Chamber of Commerce.

Ohio Conference of Statisticians held its fifth annual meeting April 7 and 8 at the Mayflower Hotel, Akron. The following rubber company statisticians served as chairmen at the April 7 sessions: C. C. Kiddey, The B. F. Goodrich Co.; and George R. Lamson, Firestone Tire & Rubber Co. Included among the speakers were Paul McPherson, merchandising manager, Seiberling Rubber Co., Barberton; and F. G. Holt, chief, Rubber Division, Bureau of Foreign and Domestic Commerce, United States Department of Commerce, Washington, D. C., who discussed "The Rubber Trade Outlook for 1933." The Ohio Conference president for 1933 is R. E. Davis, of the Goodyear Tire & Rubber Co., Akron.

India Tire & Rubber Co., Akron, operating under a receivership, has notified its dealers that it will continue to supply them with tires. The firm reports increased output and is working 6 days a week, 24 hours daily.

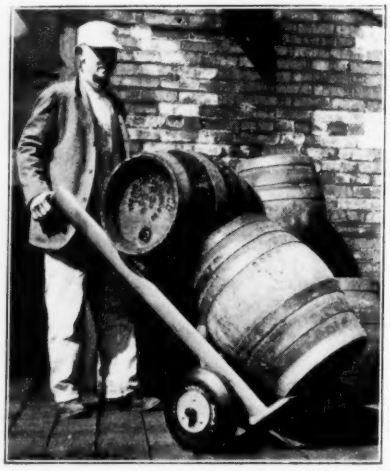
The Perfect Mfg. Co., Daylight Bldg., Cincinnati, manufactures Savasole and So-Lo plastic rubber for shoes and Spread-A-Tread plastic rubber for tires. Company officers are R. R. Bollman, president; J. J. Marx, vice president; E. M. Ach, secretary; and H. B. Flarsheim, treasurer and purchasing agent.

General Tire Notes

General Tire & Rubber Co., Akron, announces that the brewing industry has gone to the airplane for rolling equipment on which to carry around kegs and barrels of the new 3.2 beer. The brewers went to the tail-wheel of the airplane and there found a miniature streamline tire, less than a foot in diameter, from which was developed the new General Streamline Jumbo, Jr., tire with which the newest type of hand-trucks are now being equipped.

President William O'Neil states, "Crude rubber prices are bound to rise since the purchasing power of the dollar has depreciated abroad. More tires will be purchased on a rising market, and Akron will benefit accordingly.

"Tire production will be stepped up from the present rate of about 30,000,000 a year to something near the number actually needed this year, which is 60,000,000."



General Streamline Jumbo, Jr., on a Tubular Hand Truck

Zip Mold Cleaner

A new chemical preparation, known as Zip, for removing scale that accumulates on mold cavity surfaces is applied as a hot water solution in a sheet iron tank. The vessel is equipped with steam coils to raise the temperature of the cleaning liquid to 175°-190°F. If the tank is erected indoors it should be hooded to take away the fumes that arise during operation.

The operator should wear rubber gloves and avoid splashing the solution on his clothing. However it washes off very readily with water. Fifteen minutes in the solution heated to 180°F. is sufficient to remove mold scale. After its immersion the mold is thoroughly washed with water. Neither brushing or polishing is necessary after the cleaning bath.

Zip can be used indefinitely, although it may be necessary to dilute with water in case it becomes too concentrated owing to evaporation, or it may be necessary to clean the mold a longer time in case the solution becomes weaker because of excessive dilution. Standard Chemical Co., Akron, O.

Seiberling Rubber Co. of Canada, Ltd., Paton Rd., Toronto, Ont., Canada, has announced the resignation of Vice President and General Manager Clifford A. Jones because of ill health. Succeeding him in both positions is R. J. Thomas, who was with the parent concern, Seiberling Rubber Co., Akron, O., U. S. A., for 15 years prior to going with the Canadian firm when it was organized in 1927. The Canadian Seiberling board of directors has 2 new members, A. A. Leedy, factory superintendent, and J. A. Thompson, advertising and sales promotion manager.

Gutta Percha & Rubber, Ltd., Toronto, Ont., Canada, recently celebrated its golden jubilee. The firm, the oldest and largest all-Canadian rubber company, originally made a limited quantity of mechanical rubber goods, but now manufactures all kinds of mechanicals, footwear, tires and tubes, molded and stationers' rubber goods, mats and matting, etc. The company has branches from coast to coast in Canada, 2 European subsidiaries, and numerous export agencies throughout the world. It is said to be the first rubber concern in America to employ a chemist.

Canadian Raybestos Co., Ltd., 280 Perry St., Peterboro, Ont., Canada, manufactures Raybestos brake linings, clutch facings, and asbestos sheet packing. Sumner Simpson is president, and Robert Abbott, secretary-treasurer and purchasing agent.

NEW ENGLAND

Fisk Sale

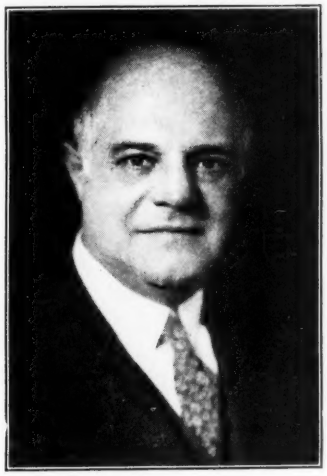
The Fisk Rubber Co., Chicopee Falls, Mass., operating under a receivership since 1929, was sold at auction on April 3 to Orrin G. Wood, representing the Fisk reorganization committee, for $3,030,000, and includes real estate, buildings, and other property of the company, such as certain stocks and other securities, patents, trade marks, etc., together with land and buildings in Chicopee Falls; Pawtucket and Westerly, both in R. I.; Jewett City, Conn.; New Bedford, Mass.; Cudahy, Wis.; and New York, N. Y. On April 4 the federal court confirmed the sale. The General Tire & Rubber Co., Akron, O., bid for the property, but not high enough.

Following the sale the new owners held a meeting, decided to continue operating the business and to push immediately a vigorous sales campaign, and selected the management and directorate of the new operating company as follows. Edward D. Levy, who was elected president when a Fisk reorganization was planned in 1931, was elected president of the new body. Charles A. Dana, one of the Fisk receivers, was made chairman of the board. Other directors are Karl H. Behr, Carl P. Dennett, Wm. E. Gilbert, Theodore G. Smith, Wm. B. Stratton, John C. Traphagen, and Mr. Wood.

The reorganization committee also announced that it has received deposits of more than 76% of the first mortgage 20-year 8% sinking fund gold bonds and of the 5-year 5½% sinking fund gold notes.

Mr. Levy, the new president, since February, 1931, had been making a detailed study of the Fisk company and its subsidiaries for the committee. Prior to that time, for 5 years, he served as president of the Pierce Petroleum Corp. Mr. Levy, who was born in Paris, Tex., in 1879 and educated in the public schools of Paris and Dallas, started work as a cash boy. He later successively became court reporter, stenographer for the Atchison, Topeka & Santa Fe Railway, its fireman, secretary to the general superintendent of the Gulf, Colorado & Santa Fe Railway, general manager of the St. Louis & San Francisco Railway, and then its first vice president and general manager and a director. In 1918 Mr. Levy was on the staff of the assistant general manager of the Emergency Fleet Corp., but later was made assistant to the president and then did special work. In 1920 he became president of the International Products Co. and in 1925 was elected to the Pierce company.

J. B. Thomas, formerly general manager of the Fisk branch in Buenos Aires, Argentina, in charge of operations in Argentina, Uruguay, and Paraguay, has been appointed agent of The Fisk Tire Export Co., Inc., also in that territory and is interested in establishing himself as manufacturers' representative in Buenos Aires. He left for the United States last month, where he will remain about 3 months at the Fisk export company's offices in Chicopee Falls, Mass.



Blank & Stoller, Inc.

E. D. Levy

Vultex Chemical Co., 708 Main St., Cambridge, Mass., manufactures Vultex and handles liquid rubber latex and compounds. George H. Bingham is president, Harvey J. Elwell, treasurer, and Hewitt MacPherson, purchasing agent.

Converse Rubber Co., Malden, Mass., has resumed operations, giving employment to over 300 workers, later to be increased to 600 with a weekly payroll of over $20,000.

Fred C. Batchellor has joined the sales department of the Woburn Degreasing Co., Woburn, Mass., as New England representative of that company's products for the rubber trade.

The United States Rubber Co., 1790 Broadway, New York, N. Y., according to F. O. Thornton, Jr., assistant sales manager, Drug Sundries and Specialties Division, added 100 girls at its Providence, R. I., plant, where they are working day and night on the new Krepe-Tex all rubber bathing suits. The company sells annually one million pairs of bathing slippers.

Ernest Jacoby, Jr., son of Ernest Jacoby, well known dealer in crude rubber, latex, and other products of the rubber industry, Boston, Mass., is now associated with his father in the business, temporarily at least. The younger Mr. Jacoby graduated from the Harvard Engineering School last year and plans in the near future to follow that profession.

Firestone Cotton Mills plant, Newburyport, has been purchased by Walter E. O'Hara, treasurer of the Textile Machinery Supply Co., Fall River, both in Mass. George C. Danielson, general manager of the Firestone plant at New Bedford, Mass., states that new machinery installed there will take care of the production formerly handled at Newburyport.

(*Continued on page* 50)

MIDWEST

1933 World's Fair

A Century of Progress International Exposition, to be held in Chicago, Ill., celebrating that city's one hundredth anniversary, will officially open June 1 and close October 31, 1933. The Firestone Tire & Rubber Co., Akron, O., will have a building housing a completely equipped tire factory. In the Hall of Science Firestone will give scientific exhibits demonstrating the chemistry of rubber. Other rubber products also will be displayed. Included among the other exhibitors are scheduled Van Cleef Bros., Chicago; General Electric Co., Schenectady, N. Y.; and Johns-Manville Corp., New York, N. Y.

J. H. Lane & Co., Inc., dealer in cotton fabrics, has moved its Chicago, Ill., office from 323 S. Franklin St. to 300 W. Adams St.

Auburn Rubber Corp., Auburn, Ind., recently held its annual stockholders' meeting at which the following directors were reelected: A. L. Murray, Thomas J. McKeon, V. E. Buchanan, A. G. Burry, and H. W. Voss. The directorate then met to select the following officers: president and manager, Mr. Murray; vice president in charge of sales, Mr. McKeon; vice president in charge of production, David Sellew; secretary, W. K. Schaab; treasurer and assistant secretary, C. H. Hanna; and assistant treasurer, R. W. Carlson. A report of business for the year ended December 31, 1932, reveals that it was one of the company's best years. The firm employs over 200 workers, and the factory operates 3, 8-hour shifts daily. Mr. Sellew states that the company is continuing its high rate of production and has been increasing monthly on such items as C'Ment-Applied half soles and heels, regular half heels, sport soles and heels, and sponge rubber knee pads.

Monsanto Chemical Works, St. Louis, Mo., through President Edgar M. Queeny on April 20 announced acquisition of control of the Swann Corp., Birmingham, Ala., which has as subsidiaries the Swan Chemical Co., Birmingham; the Provident Chemical Co., St. Louis; and the Wilckes Co., Camden, N. J.

Moline Rubber Co., manufacturer of molded rubber products, 1919 Second Ave., Moline, Ill., according to Sales Manager R. L. Shoecraft has closed its rubber plant. H. L. McLaughlin is president of the company, and R. G. Cundy, treasurer.

Van Cleef Bros., manufacturer of Dutch Brand rubber and chemical products, Chicago, Ill., in its group won the annual city-wide safety contest conducted by the Chicago Safety Council, having had only one lost-time accident in the period of the contest, 153 working days. The company also announces that its southwest representative, F. J. Keller Co., Ft. Worth, Tex., has recently added to its staff J. L. Beckley.

EASTERN AND SOUTHERN

Standardization Committee

of Tire and Fabric Manufacturers

The meeting of the Standardization Committee of the A. S. T. M. was held in New York, N. Y., April 6, when many matters were definitely cleaned up. These revisions and additions will be available in the new D-13 pamphlet to be published this year. A complete text of the new revisions and additions will also appear in the Committee D-13 preprint available to members of the committee about June 1. A summary of what has been accomplished follows:

1. Single Yarn Twist
   (a) Tolerances
   (b) Test Method
2. Yards per Pound from Cones
   (a) Tolerances
   (b) Test Method
3. Adjustment for Moisture Regain against Shipments
   (a) Moisture Regain Standard
   (b) Reporting of Tests
   (c) Test Corrected to Invoice Weight
   (d) Adjustments
   (e) Number of Tests
   (f) Sampling for Tests, Woven, and on Cones
   (g) Test Procedure—Preferred Method
   (h) Moisture Regain Corrected to Invoice Weight
4. Method of Calibrating and Checking Cord Testing Machines
   (a) Zero Position
   (b) Sensitivity
   (c) Calibration
   (d) Checking One Machine against Another

K. B. Cook, chairman of the committee, states that with the adoption of these new test methods, specifications are now pretty complete, and it is up to everyone on the committee to put these into effect as quickly as possible; and should any conditions arise involving the necessity of a change in any of these methods, it is the duty of each member to bring this to the attention of the committee so that proper action can be taken. In other words it is necessary to keep these specifications complete and up to date at all times.

Consolidated Products Co., Inc., dealer in used machinery, 15 Park Row, New York, N. Y., maintains a well-equipped, modern machine shop at 335 Doremus Ave., Newark, N. J. Shop and yards cover 8 acres, with railroad siding.

The Kelly-Springfield Tire Co., according to Louis Mueller, vice president and manufacturing manager of the Cumberland, Md., plant, has increased operations from 2 to 4 days a week. It expects soon to adopt a 5-day week. A substantial upturn in sales is responsible for the changed schedule.

Dorco Rubber Corp., 239 Fourth Ave., New York, N. Y., manufacturer's agent for the Hungarian Rubber Goods Factory, Ltd., Budapest, Hungary, handles rubber dolls and animals, inflatable toys and floats, and caps and other bathing specialties. L. A. Heymann is executive vice president and purchasing agent.

T. A. Desmond & Co., Inc., crude rubber importer, with offices at 33 Rector St., New York, N. Y., has moved to the twelfth floor of the same building.

Walter L. Tepper, president of the Martin Rubber Co., Long Island City, N. Y., will sail for Europe next month on a combined business and pleasure trip.

Nomad Electrical Engineers, Inc., 239 W. 30th St., New York, N. Y., designer and manufacturer of telephone and telegraphic equipment, is featuring the Empire phone, especially created for the ultra-modern home and office.

Vulcanized Rubber Co., Morrisville, Pa., announces that the hard rubber situation is improving.

Roehlen Engraving Works, 324 St. Paul St., Rochester, N. Y., makes solid steel engraved embossing rollers and plates for embossing all kinds of materials. The firm, says C. R. Kerrigan, has furnished its rollers to several outstanding rubber companies.

Rubber Trade Association of New York, Inc., 30 S. William St., New York, N. Y., on May 1, reports Secretary B. G. Davy, moved to 95 Broad St., New York.

Jungmann & Co., Inc., handling industrial and fine chemicals and raw materials, on April 29 moved from 155 Fifth Ave. to 157 Chambers St., New York, N. Y.

Gates Rubber Co., Denver, Colo., has appointed J. O. Edwards, mill superintendent and formerly manager of the 2 plants of the Rhodhiss Mills, Charlotte, N. C., as sales representative.

Pennsylvania Rubber Co., Jeannette, Pa., at its recent annual stockholders' meeting reelected all directors and officers as follows: directors: President W. O. Rutherford, Vice Presidents W. A. Atkins and A. C. Bowers, F. I. Merrick, and D. G. Sisterson; other officers: Treasurer, C. G. Morrill, and Secretary, C. H. Wolfe.

Admiar Rubber Co., 221 Belmont Ave., Brooklyn, N. Y., manufactures molded rubber specialties. The company's salesroom is at 200 Fifth Ave., New York, N. Y.

SOUTH AMERICA

Ernesto Costa & Cia., Buenos Aires, Argentina, of which Ernesto and Alfredo Costa, Jr., are owners, manufactures all kinds of small rubber articles as hot water bottles, ice bags, heels and soles, garters, rubber-soled leather footwear, etc. The company trade name is Hudson.

S/A Fabricas "Orion," Rua Joaquim Carlos 91, São Paulo, Brazil, manufactures druggists' sundries, balloons, balls, hose, repair material, electrical and other hard rubber goods, gloves, and rubberized piece goods. The company maintains agents in all principal cities of Brazil. Jorge Griesbach is president; Francisco Frauendorf, director-treasurer; and Otto Frauendorf, technical director.

N. J. Zinc Wins Award

In the United States District Court, for the Southern District of New York sitting in Equity, Judge Caffey, on March 27, 1933, handed down a decision awarding to The New Jersey Zinc Co. U. S. Patent No. 1,725,742 for pigmenting rayon, issued to James A. Singmaster in 1929 and by him assigned to Tubize Chatillon Corp. The decree will enjoin the defendants from operating under the patent and will order an accounting for profits.

The Bill of Complaint alleged that in 1926 Singmaster, then general manager of the New Jersey Zinc Co.'s technical department and obligated to disclose and assign to his employer all patentable ideas originating with him while so employed, conceived the idea of incorporating pigments into the cellulose mass from which rayon filaments are spun; that he failed to disclose his invention to the New Jersey Zinc Co., but left his employment on May 1, 1927, and after obtaining a patent on his invention in 1929 sold and assigned it to the Tubize Chatillon Co.; that the Tubize Chatillon Co. never recorded the assignment to it of the patent, and that when it dealt with Singmaster it had knowledge of his obligation to the New Jersey Zinc Co.

Mr. Singmaster denied that he conceived the invention while in the New Jersey Zinc Co.'s employ, denied his obligation to assign any inventions he might make; alleged that he had disclosed his idea to the New Jersey Zinc Co., and that the latter had waived its rights therein; and alleged that he did not make his invention until 7 days after his resignation took effect. The Tubize Chatillon Co. alleged that it was an innocent purchaser for value from Singmaster.

The relief asked for by the New Jersey Zinc Co. was a decree directing the defendants to assign the patents in question to the New Jersey Zinc Co., account for profits, and for an injunction. This relief was granted as noted above.

Simplex Wire & Cable Co., Boston, Mass., has moved its New York, N. Y., office to 420 Lexington Ave. Telephone: Mohawk 4-1157.

Spadone Machine Co., Inc., manufacturer of the Bolton vertical bias cutter, single and double lining strippers, and wind up machines, has moved from 15 Park Row to 122 E. 25th St., New York, N. Y.

T. W. & C. B. Sheridan Co., 135 Lafayette St., New York, N. Y., manufactures machines especially designed for embossing artificial leather and lists some of the most prominent manufacturers as its customers. The concern, which was established in 1835, has offices in Chicago, Ill.; Boston, Mass.; and London, England. LeGrand L. Clark is president, and Fred S. Tipson, treasurer.

Nathan Needle, said to be connected with a rubber trade journal, is requested to communicate with his aged mother in England.

— NEW JERSEY —

The majority of rubber manufacturers in New Jersey report improved business. The increase in orders for belting and packing is quite noticeable. The return of legalized beer has caused a rush at some plants manufacturing certain types of hose.

Pierce-Roberts Rubber Co., Trenton, is running normally in all departments.

The Thermoid Co., Trenton, has completed arrangements by which the Oil Well Supply Co. of Texas will distribute all Thermoid oil country products, such as all kinds of belting, packing, and hose. William P. Pardoe, Thermoid factory manager, who recently was seriously injured in an automobile accident, has resumed his duties.

Holland B. Slusser, vice president and treasurer of The Pocono Co., Trenton, on April 10 celebrated his forty-sixth birthday. He is a member of the executive committee of the Trenton Boy Scouts of America.

Joseph Stokes Rubber Co. states business has increased during the past month in both its Trenton and Canadian plants.

Lambertville Rubber Co., Lambertville, continues busy on boots and shoes.

Puritan Rubber Co., Trenton, announces that orders have increased and prospects for the summer are encouraging.

Essex Rubber Co., Trenton, finds business fairly good in all departments.

Whitehead Bros. Rubber Co., Trenton, is working on some large orders for belting and packing for the western trade.

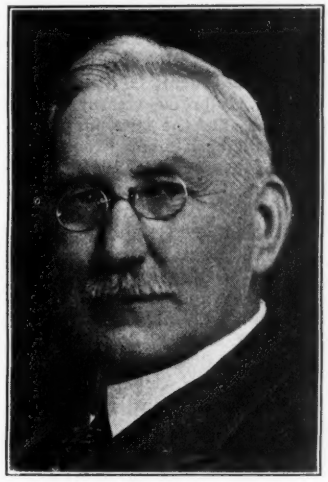
Acme Rubber Mfg. Co., Trenton, reports a decided increase in business over the previous months'. Officials are looking for still further improvement as summer approaches.

A. W. Faber, Inc., Newark, maintains a complete modern rubber plant and can manufacture practically any molded rubber article for the trade.

Mercer Rubber Co., Hamilton Square, manufactures belting, packing, perforated corrugated mats, jar rings, valves, hose, and some molded specialties. Trade names are Mercer, Hudson, Salem, and Essex in belting and hose and Redbreast Red Sheet. Company officers include W. Henry Sayen, Jr., president; F. R. Sayen, secretary; and I. Ely Reed, treasurer and purchasing agent.

U. S. S. Akron, giant Navy dirigible which crashed at sea on April 4 off the New Jersey Coast, with but 3 of its crew of 77 alive, included among its known dead Rear Admiral Wm. A. Moffett, chief of the United States Navy Bureau of Aeronautics, and Lt. Col. Alfred Fellows Masury, of the Army Reserve Corps, who as an executive of the International Motor Co.-Mack Trucks, Inc., did much to introduce the use of rubber into motor vehicles, especially in the guise of shackles and other insulation parts. He had secured many patents on this work.

— OBITUARY —



James A. Swinehart

Well-Known Tire Inventor

DEATH removed another pioneer figure of the rubber industry on April 4 when James Allen Swinehart expired at a hospital in Akron, O., after a sudden heart attack. He was widely known for his inventions perfecting tires.

The deceased was born on December 12, 1856, at Suffield, O. He attended Smithfield Academy and Buchtel College, from which he was graduated in 1878.

He served as an Akron schoolteacher until 1882, when he turned to contracting and building. In 1898, however, he invented the Firestone carriage tire and then devoted his entire attention to the rubber industry. On July 26, 1900, he helped organize the Firestone Tire & Rubber Co., Akron, becoming a vice president. But he resigned the next year to spend his time selling his foreign patents.

In 1903 Mr. Swinehart invented the cushion tire bearing his name and in 1904 with his son he started the Swinehart Clincher Tire & Rubber Co. He remained its president until 1909, when he sold his interests to take another trip abroad.

Later he invented many devices, molds, and processes and acted as consultant to several rubber companies. He retired in 1926, however, and had not been active in the rubber business since.

Mr. Swinehart belonged to the Fifty Year Club of Akron and the Grace Reformed Church.

Funeral services were held on April 6 at his home in Akron. Interment was in Glendale Cemetery.

Surviving are a daughter and a son, B. C. Swinehart, purchasing agent of the Hewitt-Gutta Percha Corp., Buffalo, N. Y.

Horace B. Tobin, president of the Woven Steel Hose & Rubber Co., Trenton, has been reelected president of Mercer Hospital, Trenton. Accompanied by his family, he is spending some time in Hot Springs, Va.

Thos. & Geo. M. Stone, Inc., engraver of metal rolls for embossing and printing textiles, paper leather, fabrics, rubber, etc., Mulberry & Murray Sts., Newark, according to R. C. Bishop is equipped to furnish the complete roll to customers' specifications in any pattern or grain desired.

Goodyear Kin

AFTER an illness of 6 weeks blood poisoning caused the death of Miss Evelyn Goodyear, 59, at the Polyclinic Hospital, New York, N. Y., on April 2. She was the granddaughter of Charles Goodyear. Surviving are 2 sisters and 2 brothers.

Factory Superintendent

WHILE wintering in Florida in an effort to regain his health, Luther S. Johnson, for 4 years superintendent of the Falls Rubber Co., Cuyahoga Falls, O., died at Del Ray Beach on April 12. He had also been associated with the Mason Tire Co., the Firestone Tire & Rubber Co., and the Lee Tire & Rubber Co.

Surviving are Mrs. Johnson and 3 children. The body was returned to Akron for burial.

Company President

LOU D. WEBER, president and general manager of The Fremont Rubber Products Co., Fremont, O., died April 15 in his home in Fremont. He had been in ill health for 10 years.

The deceased was born near Bloomington, Ill., October 17, 1871, and moved to Ohio with his parents in 1875, settling near Cincinnati. He attended the district schools and the Cincinnati public schools, then finished his education at Lebanon College. He taught school 3 years after leaving college and in 1897 went to Buford, O., to enter a mercantile business. Four years later he went to Columbus, O., and for 15 years was traveling salesman, representing the Scioto Buggy Co., Columbus Mercantile Co., and The Landis Machine Co. He went to Toledo, O., in 1916 and acquired an interest in the National Quartz & Chemical Co., which he disposed of later and moved to Fremont.

Mr. Weber started The Fremont Rubber Products Co., manufacturer of molded and mechanical rubber goods, in 1924 and was president and general manager until his death. During the past few years, however, his declining health permitted him to devote only a small part of his time to the industry. Prominent in the business and industrial life of Fremont, he was one of the organizers of the Liberty Banking Co. in 1919 and became its first cashier, where he remained only a year.

Mr. Weber was widely known because of his banking and industrial connections, and his death deeply shocked all who knew him. He was affectionately devoted to his family and home. His widow and 2 married daughters survive him.

FINANCIAL

Pennsylvania Rubber Co.

Gross profit on sales of the Pennsylvania Rubber Co., Jeannette, Pa., was $1,414,869.25 for the year ended December 31, 1932. After deducting selling, general, and administrative expenses of $925,682.81, leaves a net profit from operations of $489,186.44. After providing for depreciation $192,112.67, payment of excise taxes $196,434.65, writing down inventories, providing for interest, bad debts, and all other charges a net profit of $30,044.85 was carried to surplus.

The company continues to improve its strong financial condition. The balance sheet shows current assets at December 31, 1932, of $1,805,429.20 and current liabilities of $252,265.20, a ratio of 7.1 to 1, and leaving net current assets or working capital of $1,553,164.00.

There are no bank loans and the only liability other than for current trade items is an issue of $500,000 of unsecured 5% notes payable, maturing December 31, 1935.

The raw material position of the company is excellent, there being on hand or on order almost a year's requirements of both rubber and fabric at prices very closely approximating the extremely low December 31, 1932, market.

U. S. Rubber Co.

The 3-year 6% secured gold notes of the United States Rubber Co., of which $8,513,000 is outstanding of an original issue of $15,000,000, will mature June 1, 1933. The company offers to holders of the maturing notes 30% in cash and 70% in new 3-year secured 6% gold notes. There will be an immediate payment of 10% in cash as well as the coupon due June 1, 1933 to all noteholders assenting to the plan prior to May 1, 1933, with payment of the additional 20% in cash upon surrender of the notes when the plan is declared operative.

New Incorporations

Braintree Rubber Cement Co., Braintree, Mass., Dec. 21, capital $10,000. J. J. Driscoll, president; G. S. Reynolds, 45 Union St., Holbrook, treasurer; and M. E. Reynolds are the incorporators.

E. H. Clapp Rubber Products, Inc., Hanover, Mass. Capital 100 shares common stock. G. A. Clapp, treasurer, T. Monroe, and J. G. Ross.

M. Kaplan & Co., Chelsea, Mass. Capital 5,000 shares common stock, no par value. M. Kaplan, 215 Washington St., president and treasurer. Deal in metals, iron, and rubber.

O'Sullivan Rubber Co., Inc., Jan 30 (N.Y.), capital $10,000. L. T. McManus. G. Esterhaus, and A. Walmsley, all of 17 John St., New York, N. Y. Rubber goods.

Rubberhide Co., Trenton, N. J. Capital 1,000 shares, no par value. Principal office, Whitehead Rd., Trenton. J. E. MacDonald, Prince St., Teaneck, F. B. Williams, Jr., 35 Sherdeen Rd., Elizabeth, both in N. J., and G. B. Wood, 513 E. Grave Lane, Chestnut Hill, Pa. Manufacture rubber boots and other articles.

Tire Inventory Losses

In view of the fact that cotton and rubber prices have held steady to firm this season, where last year they were declining, inventory losses of leading tire makes will be considerably less during the first quarter than they were a year ago. The otherwise beneficial effects of this upon comparative earnings will, however, be offset to a large extent by a recent renewal of the price war among producers of the finished product. *The Magazine of Wall Street.*

Tire Production Statistics

	Pneumatic Casings—All Types		
	Inventory	Production	Total Shipments
1931	6,219,776	38,992,220	40,048,552
1932	6,115,487	32,067,732	32,200,820
1933			
Jan.	5,789,476	1,806,277	2,077,268
Feb.	5,901,557	1,871,498	1,833,970
	Inner Tubes—All Types		
1931	6,337,570	38,666,376	40,017,175
1932	5,399,551	29,513,246	30,328,536
1933			
Jan.	4,957,298	1,674,557	2,028,100
Feb.	5 085,321	1,778,818	1,681,853
	Solid and Cushion Tires		
1931	38,815	136,261	167,555
1932	23,830	97,089	108,581
1933			
Jan.	21,956	5,536	6,868
Feb.	.....	6,829	7,920

	Cotton and Rubber Consumption Casings, Tubes, Solid and Cushion Tires		Consumption of Motor Gasoline (100%) Gallons
	Cotton Fabric Pounds	Crude Rubber Pounds	
1931	151,143,715	456,615,428	16,941,750,000
1932	128,981,222	416,577,533	15,698,340,000
1933			
Jan.	7,899,233	27,368,276	1,110,564,000
Feb.	7,263,337	25,123,700	979,608,000

Rubber Manufacturers Association, Inc., figures representing approximately 80% of the industry with the exception of gasoline consumption.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Dominion Rubber Co., Ltd.	Pfd.	$1.75 q.	Apr. 12	Apr. 6
Firestone Tire & Rubber Co.	Com.	$0.10 q.	Apr. 20	Mar. 24
Goodyear Tire & Rubber Co. of Canada, Ltd.	Pfd.	$1.75 q.	Mar. 31	Mar. 15
Mason Tire & Rubber Corp.*	Com.	$0.75	Mar. 20	.....
Mason Tire & Rubber Corp.*	6% Pfd.	$1.50	Mar. 20	.....
Norwalk Tire & Rubber Co.	Pfd.	$0.87½ q.	July 1	June 22

*Liquidating.

Financial Report of Six Prominent Tire Companies

Company	Year	Funded Debt—s Millions	Interest Times Earned	Shs. Pfd. Stock Outstanding (1,000)	Earned Per Sh. Preferred	Shs. Com. Stock Outstanding (1,000)	Earned Per Sh. Common	Com. Divs. Paid Per Sh. Calendar Year	P. & L. Surplus Millions	Net Working Capital Millions
Firestone Tire & Rubber Co.	1930	21.7	NF	579nI	3	2155nI	0.65d	1.45	33.5c	52.2
	1931	20.6	NF	530nI	11nx	2115nI	1.26nx	1.00	31.4c	51.5
	1932	19.4	NF	474nI	11nx	1986nI	1.07nx	1.00	31.1c	49.3
The B. F. Goodrich Co.	1930	61.2mN	0.9d	315-I	26d	1240-I	8.55d	2.00	8.90	73.1
	1931	57.4mN	0.9d	303-I	24d-nx	1167-I	8.01d-nx	None	0.66d	61.4
	1932	NF	NF	294-I	22d	1156-I	7.48d	None	NF	NF
Goodyear Tire & Rubber Co.	1930	79.2Ps	3.0	785-I	13	1417	3.16	5.00	23.8	105
	1931	77.1Ps	2.2nx	767nI	7nx	1437	0.14nx	3.50	16.1	89.3
	1932	76.1Ps	1.1	760nI	1d	1455	4.33	5.00	10.0	91.6
Kelly-Springfield Tire Co.	1930	None	...	73.1PFP	129dFP	1064	4.13d	None	10.6d-c	8.61
	1931	None	...	72.1PFP	16dFP	1064	1.00d	None	11.1d-c	8.15
	1932	None	...	50.1	13d	737	1.31d	None	NF	NF
Lee Rubber & Tire Corp.	1930Oc	t-m	...	None	...	300-I	2.66d	None	1.12	3.50
	1931Oc	t-m	...	None	...	300-I	2.08d	None	0.49	2.89
	1932Oc	t-m	...	None	...	300-I	0.55	None	0.63	3.37
United States Rubber Co.	1930	95.0	2.2d	651nI	28d	1464	15.89d	None	7.12d	72.4
	1931	85.6	1.4d	651nI	18d-nx	1464	11.59d-nx	None	16.6d	55.0
	1932-6	69.2	NF	651nI	8d	1464	5.21d	None	NF	37.1

c—Includes capital surplus. d—Deficit. FP—1st Preferred stock. I—Includes treasury stock. m—Includes mortgages. mN—Includes mortgages and notes. nI—Not including treasury stock. nx—Before foreign exchange losses. NF—Not available. Oc—Year ended October 31. PFP—Preferred and 1st Preferred stocks. Ps—Includes Preferred stock of subsidiaries. s—Includes obligations of subsidiaries. t—Negligible amount. (6)—6 months ending June.

The Magazine of Wall Street.

Rubber Industry in Europe

GREAT BRITAIN

Rubber in Gas and Water Supply

The Rubber Growers' Association Technical Research and Development Committee has asked the Research Association of British Rubber Manufacturers to investigate, among the rest, the uses of rubber in gas and water supply. In connection with this work the Research Association, collecting samples, recently received 2 gas main joints that have been in use for 60 years and are still serviceable.

These joints, known as Forster joints, were compared with 2 other rubber rings in service 2 years. Since the 2 sets of rings are not of the same composition, the results of the tests are not strictly comparable; nevertheless they show elastic recovery after stretching, clearly indicate a much greater recovery with increasing time, of the old ring. Tests to indicate recovery after compression gave a similar result. In the resiliency test the old ring, much softer than the new, gave a rebound of 50 against 70 for the latter, a reversal of the order normal with new rubbers. However this point could be explained by the fact that the old ring, though having greater power of elastic return than the new one, takes time to show it, and in the rebound test the action is over in a small fraction of a second.

New Type of Belting

By a special process and machinery a new type of friction surface belting has been developed, using tightly woven duck that would be unsuitable for manufacturing rubber beltings by the usual processes. The duck has a breaking stress of 400 pounds per inch width in a longitudinal direction; while the mixing used has a high rubber content. The new type of belting, it is said, stretches less than any other, holds fasteners as firmly as belting of leather and balata, is flexible, and has a friction between the plies of from 25 to 30 pounds.

Rubber Printing Blankets

Replies to a questionnaire sent to 1,584 lithographers by Coates Bros. & Co., Ltd., manufacturer of printing ink and sundries, on rubber printing blankets, revealed that with most the expectation of the life of a blanket was about 6 months, while the actual number of runs obtained ranged from 480,000 to 1,700,000. A marked preference was disclosed for grey over red rubber, the ratio being 3:1, although oddly enough claims for better visibility of the printed image were made on each side. Grey blankets were generally considered much firmer than the red and less likely to soften in use.

About half the printers replying advocated periodical changing over of the blanket to relieve lateral tension and permit less volatile oils to dry out of the surface compound; but the rest did not think the practice worth the time and trouble expended. A satisfactory number of users employed a proprietary blanket wash. Finally it was shown that where paraffin or the like was employed, the life of the blanket was substantially shorter.

Crepe Rubber Boots

An extensive demand for rubber boots and waders made entirely from plantation crepe has developed among Scandinavian fisherman and lumbermen, states the *Shoe and Leather News*. These boots are said to be light and extremely durable, besides being waterproof. According to the Scandinavians, all-crepe boots keep the feet much warmer in cold weather than does any other type of footwear used. Another advantage claimed for these crepe boots is the ease with which they can be repaired with solution and crepe rubber.

To make these boots the only tools required are a sharp knife, a brush for the solution, and a hammer; no machinery is necessary. A coating of latex and talc is applied to the inside of the boot to facilitate pulling on and off.

Japanese Rubber Footwear

In reply to a question in the House of Commons concerning the volume and value of Japanese rubber footwear imported into Great Britain during 1931 and 1932, the following figures were supplied:

	1931		1932	
	Dozen Pairs	Declared Value	Dozen Pairs	Declared Value
Boots	68,447	£93,320	170,405	£145,657
Shoes				
Bathing shoes, sandals, etc.	.....	.....	20,289	10,887
Galoshes and overshoes of all kinds...	167,014	103,411	7,225	4,991
Sports shoes, plimsolls, etc.	.....	.....	318,051	176,074

Figures for 1932 are provisional.

British Notes

In its specially equipped Wolverhampton works the Goodyear Tire & Rubber Co. now produces rubber soles, heels, sheeting, and quarter rubber tips, articles the firm formerly made in Canada. The new Goodyear general sales manager, appointed to succeed A. G. Robertson, resigned, is A. S. Bishop. The latter, formerly manager of the Commercial Tire Department, has been with the company over 16 years. Incidentally, he introduced the giant pneumatic tire into England.

The Sorbo Rubber Sponge Products Co., will go into voluntary liquidation. W. H. Cork and S. F. Shuttleworth are the joint liquidators.

For fast running machinery a concrete foundation *on top* of rubber gives satisfactory results, E. T. Smith, of the Ioco Rubber & Waterproofing Co., Ltd., Glasgow, Scotland, told the Glasgow and West of Scotland Society of Engineers in a recent lecture. This finding calls to mind a road experiment carried out in Sumatra where a bitumen surface was laid *on top* of an elastic layer of latex and bitumen blocks, to reduce vibration. Mr. Smith also explained that in bakeries a sheet of rubber was arranged between the die and the dough to prevent the latter from sticking to the die in printing biscuits.

Sanderson & Co. has announced that the tea and coffee business and the rubber department have been separated. The latter has been converted into a private limited liability company known as Sanderson & Co. (Rubber), Ltd., with a capital of £60,000, of which £44,100 is being issued for cash. The partners in the new concern are Harry Douglas Cowan, Guy Butler Owen, Clarence Frederick Hall, Frederic Marie Martin Le Roux, and Alfred Rosling.

Italy

The Societa Italiana Pirelli declared a dividend of 50 lire on its 500 lire shares. It has placed to statutory reserve 1,137,500 lire and 2,000,000 lire to extraordinary reserves. The limited liability company, Pirelli e Cia., declared a 10% dividend also; while the International Pirelli Co., Brussels, Belgium, paid a 15% dividend.

France

The Compagnie du Caoutchouc Manufacture Dynamic, Paris, reports net profits of 1,006,486 francs for 1932 against 1,071,735 francs the year before. A dividend of 20 francs against 30 francs was distributed.

Michelin & Cie. is making a new type of Micheline (pneumatic-tired car) for use in the French Colonies; and Madagascar, Algeria, and Tunis are already using them. These cars are built for 18 passengers and, when fully laden, weigh 7 tons 13 cwts. each. In France, Michelines are now running on 4 of the main railway systems, and up to February 1, 1933, they covered 235,000 miles in actual service, besides 233,000 miles in tests and demonstrations.

GERMANY

Political Aspect

Rubber trade papers are very reticent regarding the present political situation and beyond an appeal to other papers to help combat atrocity propaganda make no direct statement about the action of the Hitler regime in respect of the Jews in Germany. *Gummi-Zeitung* hopes the new order will help improve economic conditions in the country, as for instance, putting pressure to bear on the hitherto liberal cartels to make them really effective against underselling.

The news that the government has taken over the Sick Funds Organizations is approved by rubber goods dealers, as these organizations had exceeded their original function, and by manufacturing certain articles themselves and supplying contributors directly with surgical rubber goods, had cut seriously into dealers' business. It is hoped that the government will bring these organizations back within their original bounds, to the benefit of private enterprise.

A direct result of the changed political conditions is the decision of the Deutsche Kautschuk Gesellschaft not to hold the planned Rubber Exhibition at Cologne this year; while the general meeting, scheduled for June 1 to 3, has been indefinitely postponed.

Leipzig Spring Fair

The Leipzig Spring Fair opened under unfavorable conditions this year, coinciding with the elections. However, since exhibitors had no illusions as to the amount of business they might be able to do, they were not disappointed.

Politics caused the Dutch, among others, to keep aloof to a certain extent; otherwise the number of foreign buyers present was greater than expected. But caution was the watchword at the Fair; and while orders were sufficiently numerous, they were generally for comparatively small amounts. Firms showing rubber goods, chiefly druggists' sundries, sporting goods, and household wares, reported business quiet, especially in the first 2 lines. Rubber aprons, mats, runners, and toys were more active and might have been better but for the tariff and exchange barriers which in some instances seriously hampered business. Thus the French duty of 30 francs per kilo on rubber aprons has virtually closed the once profitable French market for these German goods.

No outstanding novelties were displayed by rubber manufacturers, though a new material, a combination of rubber and wool fibers, was shown by Julius Friedlander G.m.b.H., Berlin, for making cardtable tops, air cushions, etc.

German Notes

The Deutsche Tornesit G.m.b.H., Hamburg, recently was formed to produce and sell the chlorinated rubber product known as Tornesit, and to exploit certain valuable patents relating to chlorinated rubber. The capital is 300,000 marks. The first directors are Helmuth Alwin Rhenius and Carl Levy, Hamburg. The New York Hamburger Gummi-Waren Co. has an interest in the new company which is said to be the only concern in Germany equipped for producing chlorinated rubber on a commercial scale.

Asbest & Gummiwerke Alfred Calmon A. G. reduced its capital in the ratio of 10:3 to 697,500 marks and then raised it to 900,000 marks. The chief shareholder now is the Helsingborgs Gummifabriks A. G., Helsingborg, Sweden.

Veritas Gummiwerke A. G., Berlin, has reduced its capital to 792,000 marks.

Bremer Gummiwerke Roland A. G., Bremen, was declared insolvent.

Walter Lindemann, former business manager of Witeka, Berlin, the recently formed sales organization of technical rubber goods manufacturers, has been replaced by Otto Friedrich.

The Harburger Gummiwarenfabrik Phoenix A. G., Harburg-Wilhelmsburg, has announced that Albert Schafer is taking over the trade management of the firm. He was for many years a director of the B. Polack A. G., Waltershausen, Thuringia, and later a director of the Continental concern.

The capital of A. G. Metzeler & Co., Munich, is now 1,800,000 marks divided into 1,800 shares of 1,000 marks each. The name of the firm has been changed to Metzeler-Gummiwerke A. G.

Netherlands

Japanese competition is making itself felt in Holland also, the Dutch correspondent of *Gummi-Zeitung* states, and in certain lines is making business, at least for the cheaper grades, practically impossible for other countries. The Dutch factories themselves are reported as having a hard time and in some instances have moved to very small towns to benefit from the lower wage rates prevailing there. At present, it is said, there are no rubber factories in Amsterdam, nor does Rotterdam have any worth mentioning.

Official figures show that imports of crude and manufactured rubber on the whole increased during the first half of 1932 as compared with those for the first half of 1931, as follows: imports, 2,683 tons of crude rubber against 2,486 tons; automobile tires, 106,428 against 92,718; tubes, 75,446 against 74,864; cycle tires 721,840 against 691,491; other goods of soft rubber, 1,703 against 1,601 tons. Imports of rubber footwear rose from 1,046,382 to 1,844,524 pairs, but the value increased only from 748,000 to 838,000 guilders. The main exports were cycle tires, which dropped from 536,396 to 260,716, and tubes, which fell from 411,425 to 232,930. Footwear exports increased from 88,477 to 103,200 pairs, but the value declined from 133,000 to 101,000 guilders.

Russia

The value of Russian imports and exports of rubber and rubber goods during 1932 markedly declined compared with 1931. The total value of rubber manufacturers exported was 2,430,000 rubles against 3,529,000. In both years, however, the amounts represented 0.4% of the total Russian exports. Imports of rubber were valued at 7,671,000 rubles against 13,876,000 rubles.

Belgium

According to the *Revue des Roulements à Billes*, the Societe Sacic (Societe Anonyme pour le Commerce et l'Industrie de Caoutchouc) of Brussels has had constructed, from designs by the engineer Ardichvili, what is considered the largest rubber mixing mill in the world. It has 2 rolls 2.14 meters long, with diameter of 800 millimeters, and weighing 8 tons each. The useful length of the cylinders is 1.94 meters, and the speeds are 10.3 and 7.6 revolutions per minute respectively.

Poland

Negotiations to continue Polgum, the Polish cartel for selling rubber footwear, failed; so it has been dissolved. Stocks of footwear on hand have been returned to the various manufacturers who will now form their own sales departments.

The Kauczuk A. G., Warsaw, has stopped payments and is in liquidation. It is understood to have offered creditors 40% payable within 2 years. The books showed a loss of 866,681 zloty at June 30, 1932, on a capital of 860,000 zloty and reserves of 667,458 zloty.

New England

(*Continued from page* 45)

New England Butt Co., 304 Pearl St., Providence, R. I., for the rubber industry manufactures Johnson Super Production tubing machines; braiders for elastic, insulated wire, and hose; spreaders; and taping machines. Executives include John G. Aldrich, president; Russell W. Knight, treasurer; and B. G. Byrne, purchasing agent.

Trimount Tire Co. has been started at 2 Seaver St., Charlestown, Mass., by Arthur Lorce and Perley Chapman.

Panther-Panco Rubber Co., Inc., with factories and branches in Chelsea and Stoughton and principal office in Chelsea, both in Mass., manufactures heels, soles, taps, strips, and toplifting material. Company trade names include Biltrite, Pancrom, Panco, Monogram, Victor, Tiger Tread, Tiger Super Service, Sure Step, and Panther for heels, and Pancrom, Panco, Panther, and Tiger for soles. Company officers are Frank Berenstein, president; Miah Marcus, treasurer; and Frank Ward, purchasing agent.

Rubber Industry in Far East

CEYLON

Methods to Obtain New Types of Rubber

The most disappointing factor in present methods of manufacturing and marketing rubber, says T. E. H. O'Brien,[1] is that despite the care taken to produce rubber of good appearance, the manufacturer is not fully satisfied with the properties of high grade plantation rubber. His main complaint is that there is too much variation in the properties of different batches of the material, particularly regarding hardness, which occasionally may vary as much as 50% from the average.

Experiments have shown that variation in the product of an individual estate can be limited to about 10 to 12½% on either side of the average by careful standardization of manufacture, but there is also considerable variation in the properties of rubber from different estates owing to inherent differences in the latex, so that to reduce variability effectively, latex from a number of estates would have to be bulked and manufactured in large central factories.

The Research Scheme has obtained satisfactory results in treating crepe rubber with hot water to improve plasticity; this treatment also minimizes discoloration during drying and storing. Methods are also being considered for preparing a hard grade of rubber, useful for special purposes, and rubber with a low content of serum substances for electrical insulation. The London staff of the Research Scheme has made rubber in the form of crumb by a process involving coagulation of the latex; so the product has similar properties to ordinary grades of plantation rubber. Samples of the rubber have been distributed to manufacturers to determine whether the product has any advantages over the usual forms of plantation rubber. This crumb rubber is expected to be more expensive to prepare than crepe.

With regard to increasing demand for latex, it is interesting to learn that Dunlop is willing to issue licenses for using centrifugal process and that inquiries are in hand regarding the supply of a machine for trial in Ceylon. No figures are available for the cost of concentrating latex by the centrifugal process, but it is likely to be slightly higher than that of ordinary ammoniated latex prepared under efficient conditions.

In concluding his article, Mr. O'Brien says that if any new manufacturing processes are introduced in Ceylon, as concentrated latex, crumb rubber, or rubber powder, he considers it essential that they should not be adopted by individual estates, but that cooperative factories be established where latex from a considerable area could be bulked and the method of manufacture efficiently controlled in order to insure the production of a uniform material.

[1] *Trop. Agr.*, Jan., 1933.

Budding and Tapping

Those regarding the budding of Hevea sceptically have sometimes remarked that results of tapping tests are not conclusive evidence of the value of the practice since the best locations are selected for the buddings and the yields generally refer to more or less scattered trees and not to compact groups of trees.

The Proefstation Midden en Oost, Java, now issues a short communication on the yields given by the clone Gondang Tapen I, which deserves attention, because the clone comprises 69 trees standing together on an area of about ⅓ hectare, and also because the estate is said to be very dry while the soil is not the best in Java. This plot, budded in 1921-22, was intended originally as a multiplication garden. The 69 trees now remaining have been carefully tested by the known methods, including the Bobilioff method of testing the latex, and have been found to belong to a single clone.

Tapping is done every other day over ⅓ the circumference, and records of individual yields have been regularly kept under European supervision since 1930. In that year, when the trees were 8½ years old, they yielded an average of 5.2 kilos of dry rubber a tree over 163 tapping days, or at the rate of 1,040 kilograms dry per hectare. The following year the yield was 6.4 kilos per tree over 182 tapping days, or 1,280 kilograms per hectare; and in 1932 this rose to 8.1 kilos per tree over 179 tapping days, or the rate of 1,620 kilograms per hectare per annum, which works out at about 1,400 pounds per acre.

So far only one serious case of Brown Bast has been noticed and 2 mild cases. The average girth at present, when the trees are 11 years old, is 70 centimeters.

Ceylon Notes

Rumor has it that a European syndicate with headquarters in India is investigating the facilities Ceylon offers for producing rubber goods locally. It seems that the organization in question plans to manufacture chiefly with an eye to the Indian market and intends to produce every type of rubber goods at present supplied by Japan to this market, with the aim of ousting that country.

The continued depression in rubber prices has led certain European firms with large tea and rubber interests to experiment with tung oil, or China wood oil, as it is also called, with the idea of replacing rubber with it. Tung oil is extracted from the kernels of the fruits of varieties of aleurites trees, *Aleurites fordii*, *Aleurites montana*, and *Aleurites cordata*, and is at present supplied chiefly by China. It is an essential ingredient in airplane paints and varnishes and is also used in other paints and for electrical insulation varnishes. At present its demand far exceeds supply, and new uses are constantly discovered; consequently it has been fetching high prices.

NETHERLANDS EAST INDIES

Results of Contest for New Uses for Rubber

At the fourth meeting of the Committee for Expanding the Sale of Rubber, held in the West Java Experiment Station, were discussed the suggestions for new uses for rubber that have been sent in to compete for the prize offered by the committee. Most of the replies submitted were too vague and fanciful to deserve consideration; others were far from original.

Of the 2 suggestions that were thought to have sufficient merit to receive a prize, one, embodying the use of latex to make 3-ply wood chests, has already been described.[1] The judges decided that while the process would probably be too expensive for making chests, as the present price of casein, otherwise used for the purpose, is exceptionally low, it might prove of great value in the European veneer industry as well as for making wings of airplanes. At a previous meeting it developed that a sample of 3-ply wood made with latex had been immersed in water for 14 days, and at the end of this period the individual plies of wood still stuck together well.

The second suggestion that evoked interest concerned latex paste for shaving soaps, depilatories, and scouring agents. Samples have been asked for; and if tests give satisfactory results, the invention will be sent on to Europe.

Regarding rubber for trunks, another suggestion, it was remarked that these are already being made in Japan.

Incidentally, J. J. B. Deuss, of the West-Java Experiment Station and a member of the above committee, left the Station to return to Holland. Great regret is expressed at the loss of this able scientist to the local tea and rubber planting industries.

[1] India Rubber World, Jan. 1, 1933, p. 55.

MALAYA

Results of Growing Demand for Latex

The value of latex is daily receiving greater recognition in various industries outside of rubber manufacturing, and the demand for latex is increasing regularly. Statistics show that whereas in December, 1931, Malaya exported 1,200 gallons of Revertex, 22,000 gallons of other concentrated latex, and 8,000 gallons of liquid latex, the amounts for December, 1932, were about, 33,000, 116,000, and 72,000 gallons respectively. The question now occupying producers is: If the demand should continue to increase at this rate, would the estates be able to supply the required quantities?

The urgency of the question was recently brought home to planters when it became known that one of the leading agency houses in Malaya was asked to submit quotations for the delivery of 20,000 to 70,000 gallons of liquid latex a month, and it was suggested that this task would be extremely difficult at present. For one thing, preparing and shipping latex requires an entirely new technique which most planters have yet to learn. But even when the intricacies of testing the dry rubber content and the alkalinity of rubber and the process of preserving the latex with ammonia and putting it up properly have been mastered, difficulties are not at an end. For, as was brought out in a recent issue of the *Straits Times*, many planters are unable to get the necessary dry rubber content with the tapping systems now in use, and a change here could not be made without adversely affecting the costs of production.

The problem that faces the producers then is to adopt a new technique of preparation and in many cases also of production; in other words complete reorganization of management and technique, which cannot be effected without extra costs. However it seems reasonable to expect that an active demand for liquid latex will result in an increase in price which will more than compensate for the additional work and costs.

Concentrated Latex Problems

The foregoing only covers the problem of shipping liquid latex. The preparation of concentrated latex, however, is so hedged in by patents that it is practically impossible for a shipper to avoid infringements; so to be on the safe side he must ship normal liquid latex. So far holders of the patents for Revertex and centrifugal rubber apparently show no disposition to grant licenses to planters to use their processes. Yet there seems to be no doubt that the real expansion of the use of latex hinges on the ability of producers to ship the latex in concentrated form.

In connection with the above question there appeared in the *Straits Times* a letter, part of which follows:

"It is true that Dunlops hold a centrifuging patent and Revertex Ltd., an evaporating patent, but there are other similar processes free to the public which have been thrown open to them by my efforts during the last 5 years.

"A process for concentration by filtration, which is very much cheaper and simpler than by heat, was thrown open to the public by my revocation suit at the Ipoh Supreme Court in 1929-31, with Revertex Ltd. Pirelli Ltd., the tire makers, have succeeded in making filters of commercial sizes and have registered grants in the S.S. and F.M.S. under the patent laws, and I suggest that anyone can call upon them under the terms of these laws to place their filters on the market here for public use.

"Similarly with Revertex Ltd., or Dunlops. Were Revertex Ltd., to place their evaporators on the market, then anyone could evaporate by my alkali processes which are open to the public.

"Then creaming latex with the addition of gum tragacanth was used by rubber research chemists and published long before patents for latex concentration were thought of. I am using the process. yours etc., (signed) V. K. Singhan."

Rubber Exports

The big drop in Malayan rubber exports in February called for some comment in the various consuming centers; it is therefore of interest to note what the *Straits Budget* has to say on the subject. The decline did not connote a falling off in production. The periodical points out that February was a short month, and on the other hand January exports were stimulated by the need of funds by small holders and native dealers to celebrate the Chinese New Year, which fell in January.

Another reason for the heavy January shipments was the change in the rates to Japan, which went into effect February 1. There had previously been an open rate of about 40¢ a case, but shipping companies agreed to raise the rate to 65¢ per case; so shippers rushed to get as much as could be shipped before the new rates began to operate.

Incidentally it seems that while the low rates to Japan prevailed, it had for some months been the practice to ship rubber for the United States to Japan and then trans-ship to America, thus effecting a saving as compared with the conference rates of $9 per ton to New York and $8.50 to the West Coast.

Attention is called to the fact that rubber destined for Japan, which for years had been sent in local cases wrapped with gunnies, has of late been shipped in standard veneer cases or bales. Some say Japan has thus been preparing for a situation which may cut her off from supplies of rubber, the idea being that if the situation should "blow over," Japan would have the large stocks of unwanted rubber in standard packing and would have no difficulty in disposing of them when the occasion demanded.

British Malaya

An official cable from Singapore to the Malayan Information Agency, Malaya House, 57 Charing Cross, London, S.W.1, England, gives the following figures for March, 1933:

Rubber Exports: Ocean Shipments from Singapore, Penang, Malacca, and Port Swettenham

	March, 1933	
To	Sheet and Crepe Rubber Tons	Latex Concentrated Latex and Revertex Tons
United Kingdom	7,883	45
United States	15,674	318
Continent of Europe	10,915	174
British possessions	1,161	4
Japan	5,184	26
Other countries	672	3
Totals	41,489	570

Rubber Imports: Actual, by Land and Sea

	March, 1933	
From	Dry Rubber Tons	Wet Rubber Tons
Sumatra	524	3,332
Dutch Borneo	106	2,263
Java and other Dutch islands	136	5
Sarawak	565	6
British Borneo	148	19
Burma	263	14
Siam	183	121
French Indo-China	215	24
Other countries	36	4
Totals	2,176	5,788

New President of the R. R. I.

A planter and former chairman of the Planters' Association of Malaya, E. N. T. Cummins, has been elected president of the Rubber Research Institute and chairman of the board to succeed H. A. Tempany, Director of Agriculture. Mr. Tempany will continue as a member of the board of the institute.

Budded Areas

According to figures from the Department of Agriculture, the total area of bud grafted rubber in Malaya was 137,974 acres at the end of 1931, and of this 34,210 acres were budded during the year. The bud grafted area now in tapping is 14,082 acres.

Most of the budwood used in 1931 was grown in the estates' own multiplication nurseries from stock originating from the Dutch Indies and from local clones. However clones isolated on Malayan estates appear to be gaining popularity. It is further observed that the number of multiplication nurseries which still exist on Malayan estates indicates that further considerable extensions of budded rubber areas in Malaya may be expected in the future.

It is interesting to note that a conservative method of tapping is being used on most estates in Malaya. About 72% in 1931 followed the alternate-daily method; 20.6% tapped on the ABC system; and only 7.3% tapped daily.

Patents and Trade Marks

MACHINERY

United States

1,899,941. **Sole Cementing Machine.** W. C. Card, Jr., Winthrop, Mass., assignor to Compo Shoe Machinery Corp., New York, N. Y.

1,899,947. **Bead Former.** W. J. Dean, Kansas City, Mo.

1,900,000. **Heel Overflow Trimmer.** T. W. Morris, Chicago, Ill.

1,900,298. **Bushing Making Apparatus.** F. C. Morris, San Francisco, Calif.

1,900,434. **Extruding Machine Cutter.** C. H. Desautels, Springfield, assignor to Fisk Rubber Co., Chicopee Falls, both in Mass.

1,900,435. **Tire Builder.** C. H. Desautels, Springfield, assignor to Fisk Rubber Co., Chicopee Falls, both in Mass.

1,900,455. **Automatic Mold Closer.** C. E. Maynard, Northampton, assignor to R. W. Boyden and C. A. Dana, as receivers of Fisk Rubber Co., all of Chicopee Falls, all in Mass.

1,900,456. **Tire Vulcanizer.** G. J. Mead, Milwaukee, Wis., assignor to Fisk Rubber Co., Chicopee Falls, Mass.

1,901,017. **Automatic Tire Inflater.** E. E. White, assignor to Pneumatic Tire Inflating Devices Corp., both of Los Angeles, Calif.

1,901,231. **Tire Casing Repairer.** A. H. Fisher, E. Cleveland, O., assignor to Kex Co., Inc., St. Louis, Mo.

1,901,306. **Vulcanizer or Drier.** G. H. Knowlton, Westbrook, Me.

1,901,359. **Testing Apparatus.** S. N. Senna, Chicopee, assignor to B. F. Perkins & Son, Inc., Holyoke, both in Mass.

1,901,569. **Tubing Machine Gear Casing.** V. Royle, Paterson, N. J.

1,902,139. **Sheet Separator.** F. B. Pfeiffer, assignor to National Rubber Machinery Co., both of Akron, O.

1,902,295. **Extruding Machine.** F. J. Shook, assignor to National Rubber Machinery Co., both of Akron, O.

1,902,306. **Tire Building Drum.** H. T. Kraft, assignor to Bridgwater Machine Co., both of Akron, O.

1,902,594. **Brake Lining Tester.** G. J. Thomas, assignor to Bendix Brake Co., both of South Bend, Ind.

1,902,627. **Plaster Mold.** P. Elbogen, Mt. Kisco, assignor of ⅓ to G. D. Kratz, Scarsdale, both in N. Y.

1,902,742. **Insulation Stripper.** A. N. Wentink, Chicago, Ill.

1,902,923. **Deflater.** J. Wahl, Rosedale, assignor to A. Schrader's Son, Inc., New York, both in N. Y.

1,902,953. **Filamentary Material Apparatus.** E. Hazell, New York, N. Y., assignor to Revere Rubber Co., Providence, R. I.

1,903,025. **Tire Repair Vulcanizer.** J. H. Browne, E. Liverpool, O.

1,903,165. **Temperature Control Instrument.** R. W. Brown, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,903,202. **Collapsible Tire Form.** H. D. Stevens, assignor to Firestone Tire & Rubber Co., both of Akron, O.

United Kingdom

383,062. **Rubber Sheeting Machine.** J. L. Milne, London. (Huttenbach, Lazarus & Sons, Ltd., Penang, Straits Settlements.)

383,158. **Coagulated Latex Rolling Machine.** E. W. Savege, Kuala Lumpur, Federated Malay States.

383,814. **Tire Making Apparatus.** Dunlop Rubber Co., Ltd., London.

384,373. **Pneumatic Tire Stitcher.** Goodyear Tire & Rubber Co., Akron, O., U. S. A.

384,378. **Tire Molding Device.** L. Mellersh-Jackson, London. (Goodyear Tire & Rubber Co., Akron, O., U. S. A.)

384,381. **Tire Retreader.** Dunlop Rubber Co., Ltd., London, and F. Fellowes, Ft. Dunlop.

384,389. **Inner Tube Apparatus.** Dunlop Rubber Co., Ltd., London, and H. Willshaw and G. H. B. Yoxon, both of Ft. Dunlop.

Germany

572,415. **Tire Spreader.** H. Ruhland, Horb, a. M.

572,979. **Tire Repair Vulcanizer.** Siemens-Schuckertwerke, A.G., Berlin-Siemensstadt.

573,148. **Shoe Press.** H. C. L. Dunker, Helsingborg, Sweden. Represented by W. von Sauer, Berlin.

PROCESS

United States

1,900,450. **Covering Tire Patches.** R. A. Labine, Springfield, assignor to Fisk Rubber Co., Chicopee Falls, Mass.

1,900,904. **Sealing Fabric.** E. H. Berger, Manville, N. J., assignor to Johns-Manville Corp., New York, N. Y.

1,900,944. **Rubber and Fiber Recovery.** J. K. Mitchell, Philadelphia, Pa., assignor to Dispersions Process, Inc., Dover, Del.

1,900,951. **Latex Impregnated Article.** G. A. Richter, W. B. Van Arsdel, and R. B. Hill, assignors to Brown Co., all of Berlin, N. H.

1,901,124. **Coating Molds and Cores.** C. M. Saeger, Jr., Bowmanstown, Pa.

1,901,442. **Driving Belt.** A. L. Freedlander, Dayton, O.

1,901,781. **Shoe Welting.** M. O. Sleeper, Hanson, assignor to G. A. Clapp, Brookline, and C. F. Woods, Winchester, receivers of E. H. Clapp Rubber Co., Boston, all in Mass.

1,901,782. **Cemented Shoe.** M. C. Smith, Jr., and E. C. Heilhecker, both of Bristol, R. I.; said Heilhecker assignor to said Smith.

1,902,780. **Footwear Knitted Lining.** R. M. Holden and J. F. Roberts, assignors to Holden Knitting Co., all of Worcester, Mass.

1,902,871. **Reenforced Vulcanized Article.** G. R. Lockhart, Providence, assignor to Manville Jenckes Co., Pawtucket, both in R. I.

1,902,921. **Pile Fabric.** G. J. Underwood, assignor to Mohawk Carpet Mills, Inc., both of Amsterdam, N. Y.

United Kingdom

383,581. **Vulcanizing and Molding Porous Rubber.** M. and P. Wilderman, both of Monte Carlo, France.

Germany

571,920. **Attaching Rubber.** Metallgesellschaft, A.G., Frankfurt, a. M.

571,959. **Goods from Latex.** Anode Rubber Co., Ltd., London, England. Represented by W. Karsten and C. Wiegand, both of Berlin.

572,154. **Nipples with Teething Rings.** W. Plaat, Koln-Nippes.

572,919. **Rubber Coated Cellulose Materials.** Dunlop Rubber Co., Ltd., London, England, and Anode Rubber Co., Ltd., St. Peter's Port, Channel Isles. Represented by R. and M. M. Wirth, C. Weihe, and H. Weil, all of Frankfurt, a. M., and T. R. Koehnhorn, Berlin.

573,025. **Rubber Covered Metal Hose.** J. Talalay, Berlin-Friedenau.

573,649. **Grained Surfaced Goods.** Anode Rubber Co., Ltd., London, England. Represented by R. and M. M. Wirth, C. Weihe, and H. Weil, all of Frankfurt, a. M., and T. R. Koehnhorn, Berlin.

573,885. **Rubber Coverings.** Metallgesellschaft A.G., Frankfurt a. M.

CHEMICAL

United States

1,900,365. **Antioxidant.** E. Rietz and W. Hoffmann, both of Elberfeld, Germany, assignors to General Aniline Works, Inc., New York, N. Y.

1,900,386. **Abrasive Composition.** J. N. Kuzmick, assignor of ½ to Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., both of Passaic, N. J., and ½ to J. S. Stokes, Spring Valley Farms, Pa.

1,900,663. **Rubber Lacquers.** H. Plauson, assignor, by mesne assignments, to Radiochemisches Forschungs-Institut, G. m. b. H., both of Darmstadt, Germany.

1,900,728. **Rubber Composition.** H. Oehme, assignor to Chemische Fabrik Kalk, G. m. b. H., both of Cologne-Kalk, Germany.

1,901,354. **Rubber-Like Mass.** K. Meisenburg, Leverkusen a. Rhine, assignor to I. G. Farbenindustrie A. G., Frankfurt a. M., both in Germany.

1,901,582. **Mixed Accelerator.** C. Coleman, Passaic, N. J., assignor to Naugatuck Chemical Co., Naugatuck, Conn.

1,902,005. **Age Resister.** I. Williams, Woodstown, N. J., and A. M. Neal, Wilmington, Del., assignors to E. I. du Pont de Nemours & Co., Wilmington, Del.

1,902,115. **Age Resister.** A. W. Campbell, Stow, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,902,379. **Age Resister.** W. Scott, Nitro, W. Va., assignor to Rubber Service Laboratories Co., Akron, O.

1,902,398. **Age Resister.** S. M. Evans, Nitro, W. Va., assignor to Rubber Service Laboratories Co., Akron, O.

1,902,405. **Age Resister.** J. R. Ingram, Nitro, W. Va., assignor to Rubber Service Laboratories Co., Akron, O.

United Kingdom

382,709. **Decorative Rubber Composition.** A. E. Bond, Surrey.

383,154. **Halogenated Caoutchouc.** I. G. Farbenindustrie A. G., Frankfurt a. M., Germany.

383,679. **Antiscorching Accelerator.** Naugatuck Chemical Co., Naugatuck, Conn., assignee of S. M. Cadwell, Grosse Pointe Park, Mich., U. S. A.

383,775. **Accelerator.** Goodyear Tire & Rubber Co., Akron, O., U. S. A.

383,832. **Ruober Dispersion.** H. D. Elkington, London, and Flintkote Corp., Boston, Mass., U. S. A.

383,962. **Rubber Composition.** Michelin & Cie., Clermont-Ferrand, Puy-de-Dome, France.

384,030. **Rubber Dispersion.** E. A. Hauser, Frankfurt a. M., Germany, and A. Gill, Manchester.

384,138. **Bituminous Emulsion.** K. D. Svensson, Stockholm, Sweden.

384,219. **Tire Nonskid Coating.** W. Josky, Hamburg, Germany.

384,648. **Antioxidant.** Goodyear Tire & Rubber Co., Akron, O., U. S. A.

384,911. **Golf Ball Treatment.** W. C. Geer, Ithaca, N. Y., U. S. A.

385,970. **Artificial Resin Suspensions.** British Thomson-Houston Co., Ltd., London, assignee of R. H. Kienle, Schenectady, N. Y., U. S. A.

Germany

572,123. **Rubber Masses.** V. Scholz, Dresden.

572,157. **Water Resistant Rubber.** Siemens-Schuckertwerke A.G., Berlin-Siemensstadt.

572,221. **Rubber Layers.** Imperial Chemical Industries, Ltd., London, England. Represented by S. Hamburger, Berlin.

572,482. **Colored Objects.** Metallgesellschaft A.G., Frankfurt a. M.

572,980. **Sulphonation Products.** I. G. Farbenindustrie A.G., Frankfurt a. M.

573,066. **Accelerator.** I. G. Farbenindustrie A.G., Frankfurt a. M.

573,233. **Treating Raw Rubber.** R. M. Ungar and P. Schidrowitz, both of London, England. Represented by B. Kugelmann, Berlin.

573,568. **Rubberlike Masses.** I. G. Farbenindustrie A.G., Frankfurt a. M.

573,569. **Compounds from Polymerizates of Butadiene Hydrocarbons.** I. G. Farbenindustrie A.G., Frankfurt a. M.

573,570. **Accelerator.** I. G. Farbenindustrie A.G., Frankfurt a. M.

573,782. **Rubber Masses.** V. Scholz, Dresden-A.

GENERAL

United States

*18,765. **Constructional Material.** A. C. Fischer, Chicago, Ill., assignor to Philip Carey Mfg. Co., a corp. of O.

1,900,002. **Wrinkle Eradicator.** A. D. Varell, New York, N. Y.

1,900,041. **Cable.** C. P. Brodhun, Wilkes-Barre, Pa., assignor to Okonite Co., Passaic, N. J.

1,900,046. **Typewriter Type Pad.** L. Denzer, Hamburg, Germany.

1,900,107. **Shoe Counter Cushion Pad.** H. L. Handler, Vallejo, Calif.

1,900,201. **Eye Cup.** S. M. Sager, Evanston, Ill.

1,900,286. **Sphygmomanometer.** W. I. Huber and L. B. Close, assignors to W. I. Huber, Inc., all of Cleveland, O.

1,900,414. **Fluid Pressure Gage.** J. Ellberg, New York, and M. Cronwall, Brooklyn, assignors to A. Schrader's Son, Inc., Brooklyn, all in N. Y.

1,900,492. **Armored Cable.** O. A. Frederickson, Ben Avon, Pa., assignor to National Electric Products Corp., New York, N. Y.

1,900,523. **Packing Gland.** E. Schmierer, assignor to Baker Perkins Co., Inc., both of Saginaw, Mich.

1,900,568. **Pneumatic Tube.** H. F. Krug, Grosse Pointe Park, Mich.

1,900,835. **Bicycle Tire and Rim.** J. M. Meredith, assignor of ¼ to B. F. Yost, both of Norfolk, Va.

1,900,963. **Bottle Closure.** A. H. Warth, Baltimore, Md., assignor to Crown Cork & Seal Co., Inc., New York, N. Y.

1,901,069. **Collapsible Fountain Syringe.** H. S. Williams, assignor to W. A. Bryans, both of Denver, Colo.

1,901,150. **Inflatable Toy.** I. and L. Dorogi, assignors of ½ to Dr. Dorogi & Co. Rubber Goods Factory, Ltd., all of Budapest, Hungary.

1,901,219. **Breathing Apparatus.** J. L. Belcher, Long Beach, Calif.

1,901,353. **Arch Support.** J. G. Mitchie, assignor to Stephenson Laboratories Trust, both of Boston, Mass.

1,901,377. **Furniture Leg Buffer.** De F. Roe, Elyria, assignor to Colson Co., Cleveland, both in O.

1,901,438. **Filtering Material.** W. C. Davidson, N. Canton, O., assignor to Hoover Co., a corp. of O.

1,901,492. **Rubber and Legging.** C. F. Berry, Boston, Mass.

1,901,540. **Bumper.** G. W. Veale, Cleveland Heights, assignor to Eaton Mfg. Co., Cleveland, both in O.

1,901,580. **Antifriction Bearing.** G. R. Bott, assignor to Norma-Hoffmann Bearings Corp., both of Stamford, Conn.

1,901,581. **Container Closure.** A. J. Chamberlain, Milwaukee, Wis.

1,901,599. **Steering Wheel.** H. A. Husted, Cleveland, O., assignor to H. A. Husted Co., Detroit, Mich.

1,901,637. **Interchangeable Tire Valve.** F. Eger, assignor to Morgan & Wright, both of Detroit, Mich.

1,901,659. **Instep Protector.** F. A. Larack, New York, N. Y.

1,901,759. **Airplane Landing Wheel.** A. G. Maranville, assignor to General Tire & Rubber Co., both of Akron, O.

1,901,780. **Weather Strip.** M. O. Sleeper, Hanson, assignor to G. A. Clapp, Brookline, and C. F. Woods, Winchester, receivers of E. H. Clapp Rubber Co., Boston, all in Mass.

1,901,859. **Life Preserver Suit.** M. Anderson, Mason City, Iowa.

1,901,862. **Pneumatic Tire.** F. F. Andersen, Oslo, Norway.

1,901,945. **Cushioning Device.** E. S. Avery, East Hampton, N. Y.

1,901,992. **Lawn Edger and Trimmer.** D. M. Smith, Portland, Ore.

1,902,048. **Matrix Material.** S. O. Thomas, Washington, D. C., assignor to American Dairy Supply Co., Augusta, Me.

1,902,082. **Tube Protector.** P. Kilimnik, Middle Village, N. Y.

1,902,323. **Chamber of Variable Volume.** G. De Monge, Brussels, Belgium, assignor to Fabrica Italiana Magneti Marelli, Societa Anonima, Milan, Italy.

1,902,433. **Nipple.** F. Brown, assignor to General Health Corp., both of Philadelphia, Pa.

1,902,633. **Fountain Pen.** W. J. Foley, W. Somerville, Mass.

1,902,686. **Heel.** L. W. Brooks, assignor of ⅓ to H. P. Arnest, both of Portland, Ore.

1,902,726. **Caster Roller.** W. F. Schacht, Huntington, Ind.

1,902,892. **Bottle Stopper and Flask Connecter.** F. M. Pottenger, Jr., Monrovia, and E. G. House, Los Angeles, both in Calif.

1,902,895. **Trouser Supporter.** F. J. C. Smith, assignor to Tenova, Ltd., both of London, England.

1,902,952. **Arch Support.** J. H. Golden, assignor of ½ to C. M. Sewell, both of Porterville, Calif.

1,903,038. **Felt Rubber Roller.** T. Fujii, assignor to E. Yumamoto, both of Tokyo, Japan.

1,903,106. **Heat Insulating Tape.** W. R. Gillies, assignor to Union Asbestos & Rubber Co., both of Chicago, Ill.

1,903,213. **Parachute.** W. J. Gleason, Houston, Tex.

1,903,225. **Weather Strip.** F. C. Palenske, assignor to Industrial Rubber Goods Co., both of St. Joseph, Mich.

1,903,344. **Valve.** L. A. Rogers, Washington, D. C., dedicated to the free use of the Public.

1,903,355. **Puncture Sealing Fluid Container.** J. A. Berger, Chicago, Ill.

1,903,365. **Dovetail and Door Bumper.** H. B. Haskins, Highland Park, and E. G. Simpson, Detroit, assignors to Ternstedt Mfg. Co., Detroit, Mich.

1,903,392. **Valve Stem and Adapter.** J. C. Crowley, Cleveland Heights, assignor to Dill Mfg. Co., Cleveland, both in O.

1,903,395. **Valve Stem.** J. C. Crowley, Cleveland Heights, assignor to Dill Mfg. Co., Cleveland, both in O.

1,903,405. **Tire.** D. I. Campbell, Muskegon Heights, Mich.

United Kingdom

383,173. **Horseshoe.** C. A. Bilbao, Vizcaya, and D. Barandica, Bilbao, both in Spain.

383,411. **Door Stop.** R. H. and B. A. Woodward, both of Birmingham, and J. R. Anderson, Wolverhampton.

383,488. **Vehicle Brake.** Ford Motor Co., Ltd., London, assignee of J. J. Wharam, Detroit, Mich., U. S. A.

383,574. **Horseshoe.** Imperator Hestesko Aktieselskap, Tönsberg, Norway.

383,847. **Stocking Ironer.** F. Schuster, Chemnitz, Germany.

383,919. **Electric Lamp Joint.** R. H. Davis, London.

383,961. **Packing Joint.** British Thomson-Houston Co., Ltd., London, assignee of E. H. Reid, Schenectady, N. Y., U. S. A.

384,005. **Parcel Carrier.** F. W. King, Dublin, Ireland.

384,085. **Tire.** D. S. Kennedy, Hampshire.

384,146. **Electric Heating Pad.** British Thomson-Houston Co., Ltd., London, assignee of J. H. Payne, Ballston Spa, N. Y., U. S. A.

384,179. **Surgical Irrigator.** A. De Borosini, Garmisch, Germany.

384,212. **Cushion Tire.** Soc. Italiana Pirelli, Milan, Italy.

384,222. **Spring.** Firestone Tyre & Rubber Co., Ltd., Middlesex. (Firestone Tire & Rubber Co., Akron, O., U. S. A.)

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*Reissue.

384,226. **Railway Vehicle Under-Carriage.** L. Renault, Seine, France.
384,259. **Door Stop.** W. Saenger, Hannover, Germany.
384,347. **Valve Discharge Cistern.** W. C. Tanner, London.
384,377. **Railway Wagon Buffer.** J. Stafford, Doncaster.
384,409. **Grinding Tool.** W. F. Chambers, Dublin, Ireland.
384,482. **Tire Pressure Gage.** H. Leo, Thuringia, Germany.
384,509. **Coupling Actuated Valve.** H. N. Hussey, G. P. Moore, and J. R. Huggins, all of London.
384,791. **Measuring Wheel.** L. R. Jones, Buckinghamshire.
384,823. **Oil Catcher and Remover.** Dunlop Rubber Co., Ltd., London, and E. F. Goodyear and J. Wright, both of Dunlop Rubber Co., Coventry.
385,146. **Röntgen-Ray Apparatus.** Naamlooze Vennootschap Philips' Gloeilampenfabrieken, Eindhoven, Holland.
385,169. **Water Tap.** E. Streppel, Westphalia, Germany.
385,674. **Rug.** L. Mellersh-Jackson, London. (S. Blumenthal & Co., Inc., New York, N. Y., U. S. A.)
385,770. **Electric Heating Pad.** R. Apt, Berlin, Germany.
385,921. **Surgical Douche.** Z. Kaszab, Budapest, Hungary.

Germany

571,815. **Nipple and Device for Making It.** F. Szezinsky, Berlin.
571,824. **Packing.** A. L. Freedlander, Dayton, O., U. S. A. Represented by E. Wesnigk, Berlin.
571,874. **Valve.** Carlshutte A.G., für Eisengiesserei & Maschinenbau, Waldenburg-Altwasser.
571,887. **Cog Belt.** Continental Gummiwerke, A.G., Hannover.
571,901. **Rail Car Disk Wheel.** Franz Clouth Rheinische Gummiwarenfabrik, A.G., Koln-Nippes.
572,106. **Tire.** A. Siewert, Berlin.
573,052. **Dental Plate.** J. Meise, Bad Homburg v. d. Hohe.
573,624. **Sponge Rubber Brush.** M. Biester, Stuttgart.
573,645. **Hot Water Bottle Closure.** L. Hescher, Frankfurt a. M.-Wiesenau.

TRADE MARKS

United States

301,116. Diamond containing in one half a representation of half the sun and its rays and in the other a crescent moon. Bristles, sponges, guts, resins, asphalt, mica, molding and packing materials, etc. Deutsche Gold- & Silber-Scheideanstalt, Frankfurt a M., Germany.
301,127. Same trade mark as in 301,116. Paper, rubber stamps, pens, pencils, erasers, etc. Deutsche Gold- & Silber-Scheideanstalt, Frankfurt a M., Germany.
301,135. Same trade mark as in 301,116. Rubber mats, blankets, binding, stoppers, protectors, coverings, sheeting, stair nosings, pads, and treads, foot pads, dummies, etc. Deutsche Gold- & Silber-Scheideanstalt, Frankfurt a M., Germany.
301,138. Same trade mark as in 301,116. Fire extinguishers, printing machines, tire vulcanizers, etc. Deutsche Gold- & Silber-Scheideanstalt, Frankfurt a M., Germany.
301,148. Same trade mark as in 301,116. Belts, hose, and packing materials. Deutsche Gold- & Silber-Scheideanstalt, Frankfurt a M., Germany.
301,179. **Klenzo.** Erasers. Blaisdell Pencil Co., Philadelphia, Pa.
301,211. **Textire.** Tires and casings. E. M. Shaner, Lynchburg, Va.
301,323. Square containing representation of an Indian chief's head and the words: **"Marathon Sport Garments."** Raincoats. Marathon Rubber Products, Inc., Wausau, Wis.
301,397. Shield containing the letter: **"F."** Mica, talc, and soapstone. Firestone Tire & Rubber Co., Akron, O.
301,398. **Firestone.** Mica, talc, and soapstone. Firestone Tire & Rubber Co., Akron, O.
301,459. **Cabled Suspension.** Fan belts. Raybestos-Manhattan, Inc., Passaic, N. J.
301,587. Label containing the letters: **"m b a"** and the words: **"Modern Bathroom Accessories."** Shower curtains. J. A. Kaplan, Inc., New York, N. Y.
301,593. **Sponge-Aire.** Cushions. Sponge-Aire Seat Co., Inc., Buffalo, N. Y.
301,608. Shield bearing the letter: **"F."** Rubber solvent. Firestone Tire & Rubber Co., Akron, O.
301,652. **Poru Lastic.** Bandages. Porus-Lastic Corp., Holbrook, Mass.
301,716. The letter: **"P"** upon the letter **"S."** Rubber. Siemens-Planiawerke A. G. fur Kohlefabrikate, Berlin-Lichtenberg, Germany.
301,734. **Aquador.** Rubber toys. Dr. Dorogi és Társa Gummigyár R. T., Budapest, Hungary.
301,789. Label containing the words: **"Safe-Tex, 100% Protection."** Prophylactic articles. Perfection Rubber Co., Akron, O.
301,800. **Boltalite.** Rubber composition sheet material. Bolta Rubber Co., Inc., Lawrence, Mass.
301,905. Label containing the words: **"Advanx Australia, Organized Tyre Service."** Vulcanizing and retreading machinery. Advanx Ty-Re-Pair Co., Ltd., Sydney, Australia.
301,934. Representation of a pressure dial within a section of hose, and the words: **"Hy Test."** Hose. United States Rubber Co., New York, N. Y.
301,970. **Firestone.** Rubber solvent. Firestone Tire & Rubber Co., Akron, O.
301,979. **Tackaid.** Plasticizer. Binney & Smith Co., New York, N. Y.
301,992. **Servbestos.** Brake linings. Thermoid Rubber Co., Trenton, N. J.
301,994. **Envoy.** Tires and tubes. Kelly-Springfield Tire Co., New York, N. Y.
302,036. **Triplex.** Tires. Triplex Tire Co., Ltd., Oakland, Calif.
302,167. **Retain-Air.** Inner tubes. General Tire & Rubber Co., Akron, O.

Hedging

IT HAS often been remarked that we do not appreciate the value of the things we have until we are deprived of them. We became keenly aware of this fact when the commodity exchanges were closed for the duration of the banking holiday.

Manufacturers who had become accustomed to protecting their purchases of raw materials through hedging operations were in a quandary, and in some cases it was reported that manufacturers had refrained from buying rather than purchase spot material upon which they could not insure themselves through hedging operations.

In the rubber market, for instance, if a manufacturer bought rubber from a dealer in actuals while the Exchange was closed, he probably paid about 3¢. Whether prices rose or fell when the Exchange reopened, he had no remedy against those future fluctuations.

By using Exchange facilities, however, he safeguards his purchases by hedging. Suppose a rubber goods manufacturer needs to buy rubber for products he wants to sell in the early summer. He would buy his rubber on the Exchange, say at 3¢. To protect himself he would sell a future contract for the same amount of rubber. He expects to sell his goods in June; so he sells a futures contract short in June for 3¢ at the same time he buys his rubber for manufacturing purposes. (Carrying charges would make the price of a futures contract in June a few points above 3¢, but we have disregarded them for simplicity.)

He makes his products, and June comes along. But the price of crude rubber is 2¢. He has paid 3¢ for raw material, and his competitor can buy it for 2¢ and underbid him—that is, he could if the manufacturer buying in April had not hedged.

Our manufacturer who bought rubber at 3¢ in April, sold a June futures contract short, also at 3¢. He now covers that short contract by buying in a June contract on the Exchange at 2¢. Thus he makes 1¢ on his futures transaction, which brings the net cost of his raw material to 2¢, the price prevailing when he sells his goods. The price of rubber might advance, and his hedge would raise the price of his raw material, but the manufacturer has, nevertheless, guaranteed the price of his raw material at the time he expects to sell his finished product. If raw materials prices rise he can increase the price of his finished product.

Hedging is an established custom among cotton manufacturers, and in the majority of cases they would no more think of buying cotton without hedging the purchase than running a business without insurance.

Cotton planters also use hedging to protect their crop when it goes to market. Take the last 2 years for instance. Early estimates predicted a large crop, which would naturally lead planters to expect lower prices as the cotton was taken to market.

A few weeks before harvest time, therefore, a farmer sells a futures contract on the Exchange at the then prevailing price, say 10¢. If, a few weeks later, when he brings his cotton to market the price has fallen to 9¢, he sells his actual cotton at 9¢, and buys another contract on the Exchange at 9¢ to cover his short sale at 10¢. He makes 1¢ on his hedge sale, bringing his return on the whole transaction to 10¢. The price of cotton might go up, too, but hedging helps the farmer to know definitely what price he is going to get.

Hedging is a widespread custom, and in many fields it is considered a form of insurance hardly less necessary than that against fire or theft.

EDITOR'S BOOK TABLE

New Publications

The Vanderbilt News. R. T. Vanderbilt Co., 230 Park Ave., New York, N. Y. The March-April issue is devoted entirely to low-sulphur compounding, which is appraised as a distinct advance in rubber technology, demonstrated by its successful adaptation to a number of commercial products. The data given compares the tensile properties of low and high sulphur compounding in pure gum, white and gas black stocks determined by standard methods of aging and other tests. Several examples are given of low-sulphur commercial compounds.

"Robertson Reminders." John Robertson Co., Inc., 121-135 Water St., Brooklyn, N. Y. This is Volume 1, Number 1, reminding users of presses and lead working and high pressure hydraulic pumps for their operation of the merits of Robertson products in those lines.

"Falk Geared-Head Motoreducer." The Falk Corp., Milwaukee, Wis. This bulletin, No. 261, describes a combination of motor and gear unit especially designed for relatively low ratios of both speed reductions and speed increase. It makes possible the use of high speed motors instead of the more costly low speed type and provides any desired speed from one-ninth motor speed to about 2½ times motor speed.

"Industrial Cooperative Gardening. The Story of a Cooperative Farm Plan Sponsored by The B. F. Goodrich Co., Akron, O." This beautiful booklet replete with action pictures gives important facts and figures of Goodrich's successful experiment, to be repeated in 1933, with cooperative farming in an effort to give its workers on reduced schedules and consequent lowered wages a chance to earn fresh vegetables for the family larder and also secure the healthful advantages of work in the open. The plan for 1933 anticipates that one day's work a week for each worker over a 25-week period will give the man and his family vegetable food for 36 weeks.

"New Bath Cap Wear by Seiberling." Seiberling Latex Products Co., Akron, O. This 20-page booklet illustrates and describes the latest in the company's bathing caps. Outstanding features include the "Conforming Head Shape" line, which is made on molds especially designed to follow the contours of the head, resulting in a cap that fits perfectly, eliminates the need of a chin strap, and prevents any tendency of the cap to work itself upward on the head; silk lined caps, which boast a white silk lining with flexible stitching to allow full elacticity and edge stretch; life-size molded rubber display heads; the "Semi-Conforming Head Shape" line; and individual Cellophane-window cartons for packaging the caps.

Book Reviews

"Rubber Producing Companies." Compiled by the Mincing Lane Tea & Rubber Share Brokers' Association, Ltd. Published by "The Financial Times," Ltd., 72 Coleman St., London, E. C. 2, England.

This standard work follows the lines of previous editions. The authentic and exhaustive information given concerns over 600 planting companies and includes capital, acreage, latest accounts, crops, purchase price, dividends, forward sales, estimates, etc. Particulars are given of many companies with tea and coffee interests, also a list of directors and secretaries of rubber companies.

"Standards Yearbook 1933." Compiled by United States Bureau of Standards, United States Department of Commerce. Washington, D. C., Government Printing Office. 250 pages and index. For sale by the Superintendent of Documents, Washington, D. C. Price $1.00.

This, the seventh edition, is full of suggestions and data for all engaged in standardization. It is a standardization reference book, summarizing current standardization activities and outstanding accomplishments during the year. The activities and accomplishments of not only the bureaus and agencies of the Federal government, but also those of states and counties are outlined. The book contains a résumé of the standardization work of scientific and technical societies and trade associations. A brief account of international cooperation in standardization is followed by a summary of the activities of the national standards associations of the various countries. This volume informs the manufacturer of the current standardization movements affecting his industry. It informs the purchasing agent of new standard specifications, and the scientist engaged in research as to current research projects which may lead to standardization.

"Handbook of Industrial Temperature and Humidity Measurement and Control." By M. F. Béhar. First Edition. Instruments Publishing Co., 1932. Cloth, 320 pages, 6 by 9¼ inches, 270 illustrations. Price $4.00.

Two separately titled books are here combined into one volume: namely, "Temperature Measurement and Control" and "Humidity Measurement and Control." These constitute, respectively, part 2 and 3 of "The Manual of Instrumentation" which the author undertook several years ago to lay the foundation of a modernized form of industrial engineering.

The volume has special value to engineers in the rubber industry. However the volume comprises not 2, but 4 separate "handbooks" (of which 3 are original treatises), plus 2 chapters both pertaining to all 4 handbooks, and 9 appendices, of which 7 pertain to temperature and 2 to humidity. These 4 "handbooks" deal with subjects of prime importance to industry: thermometry, pyrometry, automatic control of temperature, and humidity measurement and control.

"R & H Chemicals for All Industries. Quarterly Price List—April, 1933." E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. This pocket-size booklet includes a comprehensive list of chemicals and solvents for industrial and other purposes. In addition to current prices specifications and properties of many of the materials listed are given.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

No.	Inquiry
1582	Manufacturer of pimpled rubber sheeting for ping-pong paddles.
1583	Manufacturer of crepe rubber sandpaper.
1584	Manufacturer of atomizer bulbs.
1585	Manufacturer of Saprotin.
1586	Manufacturer of Vulkacit 774.
1587	Manufacturer of Pipsol X.
1588	Manufacturer of chlorinated rubber.
1589	Manufacturer of machinery for rebuilding tires.
1590	Manufacturer of gutta percha tubing.
1591	Manufacturer of uncured printers sheets.
1592	Manufacturer of rubber V-belts.
1593	Manufacturer of rubber molds for making chocolate candy.

World Rubber Absorption—Net Imports

Long Tons

	Calendar Years		1933	
Consumption	1931	1932	Jan.	Feb.
United States.	352,047	332,000	22,906	21,638
United Kingdom	76,583	78,561	6,798	5,983
Net Imports				
Australia	7,649	12,576	745	.....
Austria	2,970	1,954	140	153
Belgium	11,009	9,519	1,388	.....
Canada	25,261	20,917	1,189	1,175
Czechoslovakia.	7,717	9,463	838	681
Denmark	971	902	85	75
Finland	781	681	56	10
France	46,466	40,948	5,858	6,603
Germany	39,688	45,019	4,241	4,460
Italy	10,149	15,289	3,005	994
Japan	43,483	56,028	7,611	8,508
Netherlands	2,220	2,851	308	375
Norway	820	1,425	105	98
Russia	30,671	30,047	1,558	.....
Spain	2,605	4,342	252	.....
Sweden	3,788	4,256	394	381
Switzerland	848	614	53	45
Others	*9,600	*9,600	*800	*800
Totals	675,326	676,992	58,330	.....
Minus U. S. (Cons.)	352,047	332,000	22,906	21,638
Total foreign.	323,279	344,992	35,424	.....

*Estimate. *Compiled by Rubber Division, Washington, D. C.*

Market Reviews

CRUDE RUBBER

BUMPING phlegmatically along at the start of the month close to its monotonous level of prices, the rubber market gave no indication of the energy still present in its old quotations. But a jump from a dull day's trading of a couple of hundred tons, perhaps a thousand on a good day, to over 10,000 tons, an all-time record, is breathtaking to say the least.

But whether the rejuvenation is permanent or not is another matter. The rise began with the purchase of a large quantity of rubber by one commission house. Then rumors of restriction began to circulate again. This time they won more credence than ever before, with reports that the Dutch Minister was in favor of some measure for curtailment. Shorts began to get nervous; speculators bought on the long side. A rise followed, but was cut by profit taking.

Then the gold embargo was declared, which with continued news from the Dutch on restriction efforts renewed the buying movement. Wall Street and banking and commission houses came into the market, and prices boomed for a while, but were again deflated under profit taking.

The plans put forward for restriction center around ideas of a reduction of 50%. Traders have heard many similar plans put forward for a time and then dropped because of lack of support by the governments in the Far East. This time the Dutch Government, at least, is originating the proposal and is reported to be drafting a plan acceptable to the British.

Another favorable factor is that the man responsible for the cut in tea and sugar production is working on rubber restriction. Sentiment has definitely changed in the last few months. It used to be that the large estates opposed every form of restriction. Now they have swung over, and those that were against it are now for it.

As far as production figures for the last few months indicate, output on estates in the Far East has dropped little from the figures of 1932, even at the low prices that prevailed. If prices were to advance a few cents for any length of time, it is probable that production would also increase. With overburdened stocks, high production, and low consumption, pressure for restriction is stronger than it has been in the last 3 years at least.

RUBBER BULL POINTS

1. **Automobile production has gained markedly in April with an increase in sales.**
2. **The renewed movement for restriction is said to have the support of the Dutch Government.**
3. **Crude rubber afloat for the United States on March 31 was 29,531 long tons against 32,898 on February 28, 1933, and 44,190 on March 31, 1932.**
4. **Stocks at Singapore, Penang, etc., on March 31 were 31,405 tons against 48,103 last year.**
5. **Production of pneumatic casings in February was 3.6% over January, but 39.6% under February, 1932.**
6. **Pneumatic casings on hand February 28 were 1.9% over January, but 19.6% under February, 1932.**
7. **Akron rubber concerns report increased production and better sales.**
8. **London and Liverpool stocks are about 23% less than those of 1932.**

RUBBER BEAR POINTS

1. **March consumption of crude rubber was 18,047 tons, against 21,638 for February and 27,528 for March, 1932.**
2. **Imports of crude rubber in March at 27,879 long tons were 47.7% above those of February, although 34.2% under March, 1932.**
3. **March 31 stocks of crude rubber at 390,135 long tons are 2.2% greater than on February 28 and 16.6% over March, 1932.**
4. **Malayan shipments of rubber in March were 42,059 tons, against 39,903 last March. Ceylon shipments were 4,827 tons against 3,405 in the same periods.**
5. **For the first quarter Malay shipments were 126,222 tons, against 124,549 in the same period of 1932.**
6. **Tire prices are still unsettled owing to competitive conditions.**
7. **Shipments of pneumatic casings in February were 11.7% under January and 10.2% below February, 1932.**

Rubber statistics have shown little change in the past month. Consumption is at a new low; imports are too high; and stocks increased again in this country.

A brighter picture, however, is presented in the automobile field. Production in April has been accelerated until it is again on a level equal to that before the banking holiday. Sales are reported improved, and with better weather coming along the normal increase should set in for the season.

Tire companies are still battling against each other and seem unable to settle on a definite price policy. The cut-throat competition is damaging to the industry; but should commodity prices show a gain, a more stable policy might result.

The Outside Market was more active in the latter part of the month, when the smaller manufacturers were forced into the market by the prospect of sharply rising prices. Otherwise buying was no better than it has been for some time. Dealers bought heavily for speculative account. Restriction news is being carefully watched; and should a plan go through, it would be reflected in better sales to those manufacturers on a hand-to-month basis.

Week ended April 1. Prices on the Rubber Exchange followed those on the commodity and stock exchanges this week. Foreign news, upsetting sentiment, was reflected to some degree on the Rubber Exchange as speculators sold short. Far eastern statistics were higher again as expected.

Net price changes were of no consequence. They were one point up to 2 points down from those of last week. May closed at 3¢, compared with 3.02¢; September 3.18 against 3.17; December 3.28 against 3.29; January 3.33 against 3.34.

Last week Goodyear, Goodrich, and United States Rubber announced the elimination of their low priced tires and the concentration on 2 brands, with prices about 10% above the lowest quoted by the mail-order houses. But Firestone reduced prices on his special brand tires to equal not only those of other manufacturers, but also those sold by the mail-order houses and others. This step was a blow to the plan of stabilization that was expected by the elimination of competitive brands.

February production in the Far East on estates was 31,559 tons, compared with 35,822 tons in January and 29,896 in February, 1932. Estate stocks on February 28 were 21,278 tons against 21,517 tons on January 31 and 20,831 tons on February 29 last year. Dealers' stocks were 23,529 tons against 24,904 in January and 27,416 a year ago.

February shipments from Dutch East Indies also were lower: 15,949 tons, compared with 17,400 tons in January and 17,425 in February, 1932.

New York Outside Market—Spot Closing Rubber Prices—Cents per Pound

	March, 1933					April, 1933															
	27	28	29	30	31	1	3	4	5	6	7	8	10	11	12	13	14*	15*	17	18	19	20	21	22
Ribbed Smoked Sheet	2 31/32	2 31/32	2 31/32	2 31/32	3	3	3	2 15/16	2 15/16	3	3 1/32	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	...	...	3 1/16	3 1/16	4 1/16	4	3 1/16	3 1/16
No. 1 Thin Latex Crepe	3 3/4	3 3/4	3 3/4	3 3/4	3 13/16	3 13/16	3 13/16	3 3/4	3 3/4	3 13/16	3 13/16	3 7/8	3 15/16	4 1/16	4 1/16	4 1/16	...	...	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16
No. 1 Thick Latex Crepe	3 5/8	3 5/8	3 5/8	3 5/8	3 11/16	3 11/16	3 11/16	3 5/8	3 5/8	3 11/16	3 11/16	3 3/4	3 13/16	3 13/16	3 13/16	4 1/16	...	..	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16
No. 1 Brown Crepe	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 7/16	2 7/16	2 7/16	2 7/16	2 1/2	2 9/16	2 11/16	2 3/4	3	...	...	2 7/8	3	3 1/16	3 1/16	3 1/8	3 1/8
No. 2 Brown Crepe	2 3/8	2 3/8	2 3/8	2 3/8	2 1/8	2 3/8	2 3/8	2 5/16	2 5/16	2 5/16	2 5/16	2 3/8	2 7/16	2 9/16	2 5/8	2 7/8	...	...	2 5/8	2 11/16	3 1/16	3 1/4	3	3
No. 2 Amber	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 7/16	2 7/16	2 7/16	2 7/16	2 1/2	2 5/8	2 11/16	2 3/4	3	...	...	2 7/8	3	3 1/16	3 1/16	3 1/8	3 1/8
No. 3 Amber	2 3/8	2 3/8	2 3/8	2 3/8	2 3/8	2 3/8	2 3/8	2 5/16	2 5/16	2 5/16	2 5/16	2 3/8	2 1/2	2 5/8	2 5/8	2 7/8	...	...	2 5/8	2 11/16	3 1/16	3 1/4	3	3
No. 4 Amber	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 3/16	2 3/16	2 3/16	2 3/16	2 1/4	2 3/8	2 1/2	2 1/2	2 3/4	...	...	2 1/2	2 11/16	3 1/16	3	2 7/8	2 7/8
Rolled Brown	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/16	2 1/16	2 1/16	2 1/16	2 1/8	2 1/4	2 3/8	2 3/8	2 5/8	...	...	2 3/8	2 5/8	2 11/16	2 7/8	2 3/4	2 3/4

*Holiday.

Although February production of automobiles was lower than that last year, the first 2 months' figures showed a slight increase. A total of 106,814 units were produced this February, compared with 130,114 for January and 117,418 for February, 1932. For the first 2 months production was 236,928 against 236,762 for the same period in 1932.

Buying tapered off in the Outside Market during the week with prices holding at the levels of the previous week. Nearby contracts on ribbed smoked sheets sold at $3\frac{1}{16}$¢; July-September $3\frac{3}{16}$; October-December $3\frac{5}{16}$; and January-March $3\frac{7}{16}$.

Week ended April 8. Malay statistics, released early in the week, were disappointingly large, although the detail that the United States was the only country to receive less rubber than last year was more encouraging. Even with this report on hand and a lack of factory interest, the market was able to show a gain in prices at the end of the week. It was largely a result, however, of commission buying, and the volume of trading was augmented also by switching operations.

At the week-end prices were from 9 to 14 points higher than the week before: April sold at 3.06¢ compared with 2.92¢ the week before; July 3.18 against 3.08; September 3.28 against 3.18; December 3.39 against 3.28; and March 3.51 against 3.42.

Total March shipments from Malay were 42,059 tons, compared with 37,564 tons in February and 39,903 tons in March, 1932. Shipments to the United States were 15,674 tons, compared with 14,565 in February, and 24,254 in March, 1932. All other countries received larger shipments than they did a year before.

For the first quarter Malay exports were 126,222 tons, compared with 124,549 in the same period last year. Ceylon shipments for similar periods were 14,507 tons against 12,435.

Factory inquiry in the market is for rubber at prices below the market, and sellers are reluctant to make concessions. The rise in price was largely in sympathy with the rise in other commodity markets during the week and the talks of inflation at Washington.

In Akron reports were forthcoming of increased production by tire manufacturers. The B. F. Goodrich Co. was said to have increased its production schedule by 50% as a result of the generally improved financial situation, the introduction of a new safety-type tire, and seasonal upturn, according to President James D. Tew. The Goodyear Tire & Rubber Co. resumed a 5-day week after a lull during the banking holiday; while the General Tire & Rubber Co. continued its 6-day week.

The usual seasonal increase in tire production has been delayed this year because of banking difficulties. A trader just returned from the tire district said that in one section where several large manufacturers are, only one small bank had reopened its doors, and the whole community was dependent on this small depository for its working capital.

Only one automobile manufacturer was reported to have reduced output in the April 1 week. Production rose to 22.9 for that week, according to *The New York Times'* index, which is adjusted for seasonal variations, compared with 19.9 in the previous week and 39.8 for the same week in 1932. Ford produced 5,000 units, compared with only 3,750 in the preceding week.

The only interest displayed by buyers in the Outside Market during the week was in prices below the market, and since dealers were firm, little business was done. It was stated that buyers have not paid the market for some time, and business is being done at all sorts of prices. But a better feeling is apparent because of talks of inflation.

Prices were a shade higher than last week in sympathy with outside influences. April-June ribbed smoked sheets sold at $3\frac{1}{8}$¢ compared with $3\frac{1}{16}$ the week before; July-September $3\frac{5}{16}$ against $3\frac{3}{16}$; and October-December $3\frac{7}{16}$ against $3\frac{5}{16}$.

Week ended April 15. To those who have followed the sluggish action of the rubber market for the last year the rise of 61 to 68 points in this week's market, contrary to the trends in other commodities, will indicate that it must have been a week of unprecedented activity. It was. Twice, the day's sales on the Exchange reached 4,500 tons, and on Thursday 5,930 long tons exchanged hands, the largest day's transaction since August 30, 1932.

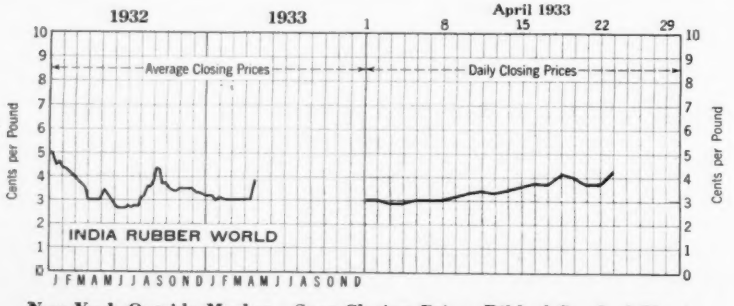
The May contract closed at 3.71¢ on Thursday night, compared with 3.10¢ the previous Saturday; July 3.85 against 3.18; September 3.94 against 3.28; December 4.07 against 3.39; and March 4.14 against 3.51.

The bulk of activity came from speculative sources however. One large commission house bought heavily, for what reason could not be determined. Gossip had it that restriction developments were imminent between the Dutch and the British. Naturally, when the news got about, shorts began to cover; and as the market continued to advance, there was a rush to get on the band wagon.

A news article published in London gave the scheme of an Amsterdam broker, Mr. Wynand, for a 10-year convention plan under which growers would agree on production quotas until 1937. Rubber data would be collected by a central office, and international delegates would be chosen from each nation to set world production. Further growing of rubber would be restricted during the life of the plan.

Later in the week proposal for 50% restriction based on production in the 3 years from 1928-1930 came from M. Bolderhey, managing director of the

(*Continued on page 66*)



New York Outside Market—Spot Closing Prices Ribbed Smoked Sheets

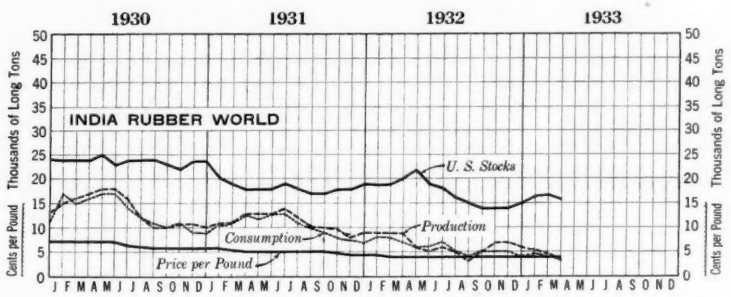
New York Quotations

New York outside market rubber quotations in cents per pound

Plantations	Apr. 26, 1932	Mar. 28, 1933	Apr. 25, 1933
Rubber latex....*gal.*	51	42	42
Sheet			
Ribbed, smoked, spot	$3\frac{1}{16}/3\frac{1}{8}$	$2\frac{15}{16}/3$	$4\frac{1}{8}/4\frac{1}{4}$
May-June	$3\frac{1}{8}$	...	$4\frac{1}{8}/4\frac{1}{4}$
July-Sept.	$3\frac{1}{4}/3\frac{5}{16}$	$3\frac{1}{8}/3\frac{3}{16}$	$4\frac{3}{8}/4\frac{5}{16}$
Oct.-Dec.	$3\frac{3}{8}/3\frac{7}{16}$	$3\frac{1}{4}/3\frac{3}{8}$	$4\frac{5}{16}/4\frac{5}{8}$
Crepe			
No. 1 thin latex, spot	4 /4$\frac{1}{16}$	$3\frac{11}{16}/3\frac{7}{8}$	5
May-June	4 /4$\frac{1}{16}$	...	5 /5$\frac{1}{8}$
July-Sept.	$4\frac{1}{8}/4\frac{3}{16}$	$3\frac{7}{8}/4\frac{1}{8}$	$5\frac{1}{16}/5\frac{1}{4}$
Oct.-Dec.	$4\frac{1}{4}/4\frac{3}{8}$	4 /4$\frac{1}{4}$	$5\frac{1}{16}/5\frac{1}{2}$
No. 3 Amber, spot	$2\frac{1}{8}$	$2\frac{3}{4}/2\frac{7}{8}$	$3\frac{1}{2}/3\frac{9}{16}$
No. 1 Brown	3	$2\frac{7}{16}$	$3\frac{7}{16}$
Brown, rolled	$2\frac{11}{16}/2\frac{13}{16}$	$2\frac{1}{8}$	$3\frac{7}{16}/3\frac{1}{4}$
Paras			
Upriver fine	5¼	5¾	7½
Upriver fine	*8	*9	*10¼
Upriver coarse	†2½	...	...
Upriver coarse	*4¼	*5	*6
Islands fine	†5	6	7
Islands fine	*7¾	*9	*10
Acre, Bolivian fine..	5⅜	6	7½
Acre, Bolivian fine..	*8¼	*9½	*10¾
Beni, Bolivian	5⅜	6⅛	7⅜
Madeira fine	5¼	5⅞	7½
Pontianak			
Bandjermasin	5	4	4½
Pressed block	7½	6½	7
Sarawak	5	4	4½
Caucho			
Upper ball	†3½	...	...
Upper ball	*4¼	*5	*6
Lower ball	†2	...	...
Manicobas			
Manicoba, 30% guar.	†2½	†2¼	†2¾
Mangabiera, thin sheet	†2½	...	...
Guayule			
Duro, washed and dried	12	12	12
Ampar	13	13	13
Africans			
Rio Nuñez	8	8	9½
Black Kassai	8	7½	9½
Manihot cuttings	4	3½	4
Prime Niger flake	15	15	16
Gutta Percha			
Gutta Siak	7½	6¼	6½
Gutta Sch	16	12	12½
Red Macassar	1.50	1.50	1.50
Balata			
Block, Ciudad Bolivar	16	18	18
Manaos block	16	19	19
Surinam sheets	32	28	29
Amber	35	30	31

*Washed and dried crepe. Shipments from Brazil. † Nominal.

RECLAIMED RUBBER


1930
1931
1932
1933
INDIA RUBBER WORLD
Thousands of Long Tons
Cents per Pound
U. S. Stocks
Consumption
Production
Price per Pound
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D

Production, Consumption, Stocks, and Price of Tire Reclaim

United States Reclaimed Rubber Statistics—Long Tons

Year	Production	Consumption	Consumption Per Cent to Crude	United States Stocks*	Exports
1930	157,967	153,497	41.5	24,008	9,468
1931	132,462	125,001	35.7	19,257	6,971
1932	75,656	77,500	23.3	21,714	3,536
1933					
January	5,301	4,811	21.0	16,262	130
February	4,578	4,363	20.2	16,570	178
March	3,847	3,454	19.1	15,496	353

* Stocks on hand the last of the month or year.

Compiled by The Rubber Manufacturers Association, Inc.

INFLATION has stimulated the reclaim market by the advance it caused in crude rubber. Banking conditions generally have improved since last month. Manufacturers will be moved to enter the market for the higher grades of reclaim because of their better technical quality and the tendency to displace with them a percentage of higher priced crude. The seasonable spring demand now starting will doubtless be encouraged as business hastens into activity under the influence of the rise in prices of general products.

The demand for hose, belting, etc., by breweries is assisting the manufacturers of mechanical rubber goods and in turn stimulating the call for reclaims. The estimate that the brewing industry will expend about $3,500,000 for tires and $750,000 for general mechanical rubber goods reflects the ideas of one of the leading eastern brewing companies based on current low prices. The total will reach still higher figures, however, if prices advance as expected.

Production of reclaim in the United States for March totaled 3,847 tons, a decline of about 15% from February production. Reclaim consumption for March was 3,454 tons, a decline of 13% from February's figure. The ratio of consumption of reclaim to crude was 19.1% in March.

Quotations of standard reclaim qualities are unchanged from one month ago.

New York Quotations

April 25, 1933

	Spec. Grav.	Cents per Lb.
High Tensile		
Super-reclaim, black	1.20	5 /5¼
red	1.20	4¾/5
Auto Tire		
Black	1.21	3¾/4
Black selected tires	1.18	4 /4¼
Dark gray	1.35	5 /5¼
White	1.40	6 /6¼
Shoe		
Unwashed	1.60	4¾/5
Washed	1.50	5½/5¾
Tube		
No. 1	1.00	6½
No. 2	1.10	4½/4¾
Truck Tire		
Truck tire, heavy gravity	1.55	5 /5¼
Truck tire, light gravity	1.40	5¼/5½
Miscellaneous		
Mechanical blends	1.60	3 /3½

U. S. Crude and Waste Rubber Imports for 1933

	Plantations	Latex	Paras	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Totals 1933	Totals 1932	Balata	Miscellaneous	Waste
Jan. ..... *tons*	30,123	680	297	10	..	..	..	31,110	31,298	8	516	..
Feb.	18,407	246	217	5	..	..	..	18,875	30,546	16	483	1
Mar.	27,074	528	269	8	..	..	..	27,879	42,382	49	836	..
Total, 3 mos., 1933 ..... *tons*	75,604	1,454	783	23	..	..	..	77,864	.....	73	1,835	1
Total, 3 mos., 1932 ..... *tons*	102,641	967	526	92	..	..	..	.....	104,226	216	2,174	75

Compiled from The Rubber Manufacturers Association, Inc., statistics.

RUBBER SCRAP

THE advance of commodity and security prices that resulted from the temporary abandonment of the gold standard served to brighten the aspect of business in all lines. Conditions in the rubber scrap trade were reported brighter. The possibility that the Dutch and British Governments may unite to restrict exports of crude rubber also had a stimulating market influence.

BOOTS AND SHOES. The demand for black shoes is good. Collections of this grade, however, are poor, and the supply is scanty because of the popularity of goods in colors for sports and general wear.

TIRES. This grade of scrap is still in steady demand, influenced by the firm prices prevailing for crude. Prices of tires have advanced 25 to 50¢ a ton on some descriptions.

TUBES. Similar conditions prevail with respect to inner tubes as in the case of tire scrap. Prices are ⅛ to ½¢ per pound higher than a month ago.

SOLID TIRES. This grade is in fair demand, but sources are becoming depleted steadily, to make collections uncertain and scanty.

MECHANICALS AND HARD RUBBER. The market is dull. There has been no quotable change in the past month. Prices are extremely low with scarcely any demand in comparison with that for higher qualities of scrap.

Quotations of standard grades show some advances in tires and tubes.

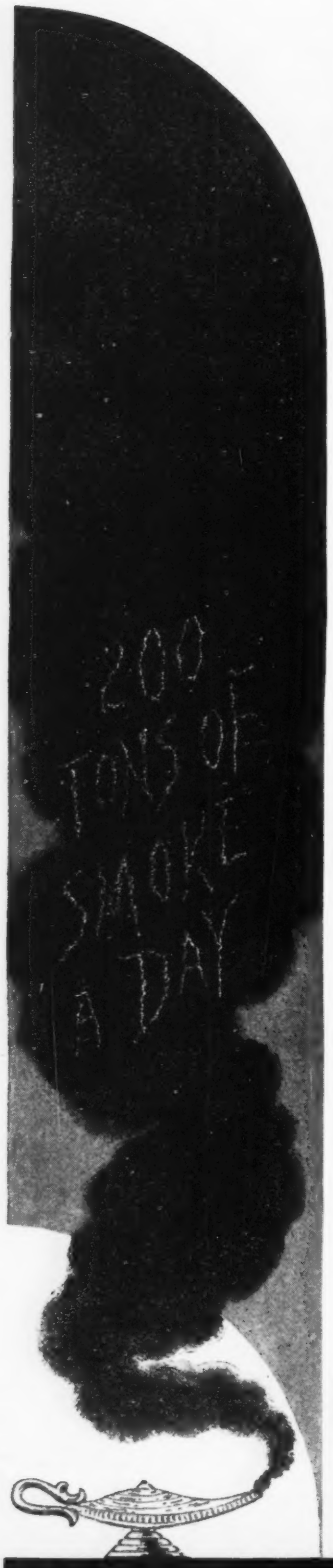
CONSUMERS' BUYING PRICES

Carload Lots Delivered Eastern Mills

April 25, 1933

	Prices
Boots and Shoes	
Boots and shoes, black..100 *lb.*	$0.75/$0.90
Colored .....100 *lb.*	.625 /.75
Untrimmed arctics.....100 *lb.*	.50
Inner Tubes	
No. 1, floating .....*lb.*	.02½/.02¾
No. 2, compound .....*lb.*	.01¼/.01⅜
Red .....*lb.*	.01⅜/.01½
Mixed tubes .....*lb.*	.01¼
Tires (Akron District)	
Pneumatic Standard	
Mixed auto tires with beads .....*ton*	7.25/ 7.75
Beadless .....*ton*	10.50/10.75
Auto tire carcass .....*ton*	6.50/ 6.75
Black auto peelings ...*ton*	17.00/18.00
Solid	
Clean mixed truck....*ton*	26.00/26.50
Light gravity .....*ton*	28.00/29.00
Mechanicals	
Mixed black scrap .....*lb.*	.00⅜/.005
Hose, air brake .....*ton*	6.00 /6.50
Garden, rubber covered *lb.*	.00¼/.00⅜
Steam and water, soft...*lb.*	.00¼/.00⅜
No. 1 red .....*lb.*	.01⅜/.01¼
No. 2 red .....*lb.*	.01 /.01¼
White druggists' sundries. *lb.*	.01¼/.01½
Mechanical .....*lb.*	.00¾/.00⅞
Hard Rubber	
No. 1 hard rubber ..*lb*	.06¼/.06½

Smith & Serrell, with factory at New Brunswick and office at 20 Washington Pl., Newark, N. J., is sales agent for Francke flexible couplings, and Waldron torque ring couplings and silent steel gears.



MICRONEX

Which will you have...

MICRONEX

or

VARIABILITY?

...you can't have both!

BINNEY & SMITH CO.

41 East 42nd St., New York

The Magic Lamp ~ Your Protection for Over 50 Years

COMPOUNDING INGREDIENTS

THE reopening of many banks in Ohio and the Midwest caused an upturn of business with suppliers of materials for the rubber trade. Tire manufacturers generally are operating on extremely restricted production schedules. Early in the month there was a marked disposition of rubber consumers to cover their requirements by contract through the balance of the year, but suppliers were not willing to take such contracts because of the strong possibility of commodity price inflation and possibly general inflation, including labor costs.

Requests for contracts at current levels were subjected to close scrutiny, and contract protection was being extended only in the case of raw products which are also covered by contracts.

These comments relate not only to rubber chemicals, but to industry as a whole previous to April 19. On that day the United States went off the gold standard, so commodity prices immediately rose in response as the value of the dollar dropped in the world's money markets, and business uncertainty was suddenly dissipated.

The carbon black market is continuing firm with demand comparing favorably with the corresponding period one year ago. Most of the business is covered under annual contract so that price changes will not take place for the next few months.

Domestic rubber compounding clays are strongly influenced by the paper clay market. These were forced down to record low levels by the influx of English paper clays under depreciated Sterling. Devaluation of the dollar will tend to correct this situation and will be reflected in advancing prices of all domestic clays including the rubber type.

A good amount of business is being done in up-to-date rubber chemical specialties and improved compounding ingredients with the more enterprising rubber goods manufacturers.

The tonnage of titanium pigments sold to the rubber industry over the first quarter of the current year exceded that of the corresponding period of 1932. April prices were unchanged at 6 and 6¼¢ for barium and calcium base.

Market conditions regarding factice changed but little in April as compared with March. Improvement in business and prices, however, are in prospect in the near future. A matter of serious importance to manufacturers of factice is the action that Congress will take regarding a duty on imported oils and a special processing tax on domestic oils.

On April 20 commercial grade litharge advanced from 5¾¢ to 6¼¢ a pound. Lithopone was in fair demand at 4½ to 4¾¢. Rubber solvents, both heavy and light, held firm at 5¼¢ in tank cars at Group 3 refineries.

Para-Dors is the trade designation of a line of aromatic chemicals to eliminate the smell of rubber goods by either neutralization or reodorization.

Aresco is a new wetting agent used with latex to obtain wetting and penetration of fabrics. It is offered to the trade in liquid form containing approximately 50% by weight of active material in water.

Vulcan colors, in a large variety of tints, are being offered as a new line of pigments for rubber goods manufacturers featuring articles in attractive colors.

New York Quotations

April 25, 1933

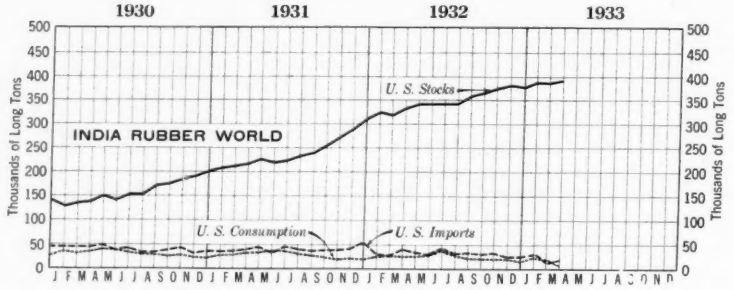
Prices Not Reported Will Be Supplied on Application

Abrasives		
Pumicestone, pwd.	lb.	$0.02½/$0.04
Rottenstone, domestic	ton	23.50 /28.00
Accelerators, Inorganic		
Lime, hydrated	ton	20.00
Litharge (commercial)	lb.	.06¼
Magnesia, calcined, heavy	lb.	.04 / .04½
carbonate	lb.	.05¼/ .06
Accelerators, Organic		
Accelerator 49	lb.	.38 / .48
Aldehyde ammonia	lb.	.65 / .70
Altax	lb.	
Barak	lb.	
BLE	lb.	
Butene	lb.	
Captax	lb.	
Crylene	lb.	
paste	lb.	
DBA	lb.	
Di-esterex N.	lb.	
DOTG	lb.	.42 / .52
DPG	lb.	.33 / .43
du Pont 808	lb.	
833	lb.	
Ethylidine aniline	lb.	
Formaldehyde aniline	lb.	.37½/ .40
Heptene	lb.	
base	lb.	
Hexamethylenetetramine	lb.	.37
Lead oleate, No. 999	lb.	.09
Witco	lb.	.10
Lithex	lb.	
Monex	lb.	
Novex	lb.	
Plastone	lb.	
R & H 40	lb.	
50-D	lb.	
Safex	lb.	
Super-sulphur No. 1	lb.	
No. 2	lb.	
Tetrone A	lb.	
Thiocarbanilid	lb.	.20
Thionex	lb.	
Trimene	lb.	
base	lb.	
Triphenyl guanidine	lb.	.58 / .60
Tuads	lb.	
Vulcanex	lb.	
Vulcanol	lb.	
Vulcone	lb.	
ZBX	lb.	
Zimate	lb.	
Acids		
Acetic 28% (bbls.) 100	lbs.	2.65 / 2.90
glacial (carboys) 100	lbs.	9.64 / 9.80
Sulphuric, 66°	ton	15.50
Age Resisters		
Age-Rite Gel	lb.	
powder	lb.	
resin	lb.	
white	lb.	
Albasan	lb.	
Antox	lb.	
Neozone	lb.	
Permalux	lb.	
VGB	lb.	
Zalba	lb.	
Antiscorch Material		
UTB	lb.	
Antisun Materials		
Heliozone	lb.	
Sunproof	lb.	
Binders, Fibrous		
Cotton flock, dark	lb.	$0.09 /$0.11
dyed	lb.	.50
white	lb.	.11 / .16
Rayon flock, colored	lb.	1.60
white	lb.	1.40
Colors		
BLACK		
Bone, powdered	lb.	.05½/ .15
Drop	lb.	.05½/ .17
Lampblack (commercial)	lb.	.08 / .12
BLUE		
Prussian	lb.	.35 / .37
Toners	lb.	.80 / 3.50
Ultramarine	lb.	.07 / .10
BROWN		
Mapico	lb.	.13
Sienna, Italian, raw, pwd.	lb.	.04½/ .11
GREEN		
Chrome, light	lb.	.23 / .25½
medium	lb.	.26 / .27½
oxide	lb.	.19 / .21
Guignet's	lb.	.75
Toners	lb.	.85 / 3.50
ORANGE		
Toners	lb.	.40 / 1.60
ORCHID		
Toners	lb.	1.50 / 2.00
PINK		
Toners	lb.	1.50 / 4.00
PURPLE		
Toners	lb.	.60 / 2.00
RED		
Antimony		
Crimson, R. M. P. No. 3	lb.	.46
Sulphur free	lb.	.48
7-A	lb.	.32
Z-2	lb.	.20
Iron Oxides		
Rub-er-red	lb.	$0.08¾/$0.09½
Mapico	lb.	.08¾
Toners	lb.	.80 / 2.00
WHITE		
Lithopone (bags)	lb.	.04½/ .04¾
Albalith	lb.	.04½/ .04¾
Cryptone No. 19	lb.	.06 / .06½
CB No. 21	lb.	.06 / .06½
Titanium oxide, pure	lb.	.17 / .18½
Titanox "B"	lb.	.06 / .06¼
"C"	lb.	.06 / .06¼
Zinc Oxide		
Black label (lead free)	lb.	.05¾
F. P. Florence, green seal	lb.	.09½/ .09¾
red seal	lb.	.08½/ .08¾
white seal (bbls.)	lb.	.10⅞
Green label (lead free)	lb.	.05¾
seal, Anaconda	lb.	.09½/ .10¼
Horsehead (lead free) brand		
Selected	lb.	.05¾/ .06
Special	lb.	.05¾/ .06
XX	lb.	.05¾/ .06
green	lb.	.05¾/ .06
red	lb.	.05¾/ .06
Kadox, black label	lb.	.09½/ .09¾
blue label	lb.	.08½/ .08¾
red label	lb.	.07¼/ .07½
Lehigh (leaded)	lb.	.0490/ .0515
Red label (lead free)	lb.	.05¾
seal, Anaconda	lb.	.08½/ .09¼
Standard (leaded)	lb.	.05½/ .05¾
Sterling (leaded)	lb.	.05½/ .05¾
Superior (leaded)	lb.	.05½/ .05¾
U. S. P. (bbls.)	lb.	.12¾
White seal, Anaconda	lb.	.10¾/ .11¾
XX zinc sulphide (bbls.)	lb.	.13
YELLOW		
Chrome	lb.	.15
Mapico	lb.	.09½
Ochre, domestic	lb.	.01¾/ .02¼
Toners	lb.	2.50
Factice—See Rubber Substitutes		
Fillers, Inert		
Asbestine	ton	
Barytes (f.o.b. St. Louis)	ton	23.00
off color	ton	
white	ton	
Blanc fixe, dry, precip	ton	60.00 /65.00
pulp	ton	42.50 /45.00
Infusorial earth	ton	40.00 /45.00
Kalite No. 1	ton	
No. 3	ton	
Suprex, heavy	ton	45.00 /55.00
white, extra light	ton	60.00 /80.00

Whiting		
Chalk, precipitated	lb.	
Domestic	ton	$3.50 /$5.00
Hakuenka	lb.	
Paris white, English cliff-stone	100 lbs.	
Sussex	ton	
Witco	ton	15.00
Fillers for Pliability		
Flex	lb.	
Fumonex	lb.	.0235/ .06
P-33	lb.	
Thermax	lb.	
Velvetex	lb.	.02 / .05
Finishes		
Lacquer, rubber, No. 106	gal.	3.00
Mica, amber	lb.	.04
Starch, corn, pwd.	100 lbs.	2.49 / 2.60
potato	lb.	.03¾/ .04½
Talc, dusting	ton	20.00
Pyrax A	ton	
Latex Compounding Ingredients		
Accelerator 552	lb.	
Aquarex	lb.	
Catalpo	ton	
Colloidal color pastes	lb.	
sulphur	lb.	
zinc oxide	lb.	
Disinfectants	lb.	
Dispersed Antox	lb	
Emulsified Heliozone	lb.	
Neozone L	lb.	
Tepidone	lb.	
Mineral Rubber		
Genasco (fact'y)	ton	30.00 /32.00
Gilsonite (fact'y)	ton	37.34 /39.65
Granulated M. R.	ton	
Hydrocarbon, granulated	ton	40.00 /42.00
hard	ton	
Parmr Grade 1	ton	20.00 /23.00
Grade 2	ton	20.00 /23.00
Mold Lubricants		
Sericite	ton	
Soapbark (cut)	lb.	.05½/ .06
Soapstone	ton	20.00
Oils		
Castor, blown	lb.	.11¼/ .11¾
Poppy seed	gal.	1.55
Red, distilled (bbls.)	lb.	.06 / .06¾
Protective Colloid		
Casein, domestic	lb.	.08 / .08½
Reenforcers		
Carbon Black		
Aerfloted arrow black	lb.	.02¾
Arrow specification black	lb.	.03
Century (works, c. l.)	lb.	.0272
Certified, Cabot, c. l., f. o. b. works, bags	lb.	.02¾
c. l., f. o. b. works, cases	lb.	.04¼
l. c. l., f. o. b. works	lb.	.04¾
Spheron (Dense Dustless Black) c. l., f. o. b. works	lb.	.02¾
Disperso (works, c. l.)	lb.	.0272
Dixie brand	lb.	.0272/ .06½
Kosmos brand	lb.	.0272/ .06½
Micronex	lb.	.03 / .07
Ordinary (compressed or uncompressed)	lb.	.02¾/ .06
Clays		
Blue Ridge, dark	ton	
China	ton	7.00
Dixie	ton	
Langford	ton	
Par	ton	
Perfection	ton	25.00
Standard	ton	
Suprex No. 1	ton	8.00
No. 2, dark	ton	6.50
Glue, high grade	lb.	.16 / .24
Reodorants		
Amora A	lb.	
B	lb.	
C	lb.	
D	lb.	
Rodo	lb.	
Rubber Substitutes or Factice		
Amberex	lb.	.13¾
Black	lb.	.06 / .08
Brown	lb.	.05¾/ .11
White	lb.	.07½/ .12
Softeners		
Burgundy pitch	lb.	.04
Emo, brown	lb.	.05
white	lb.	.07
Hardwood pitch, c.l.	ton	24.00 /25.00
Palm oil (Witco)	lb.	.08
Palmol	lb.	.08¼
Petrolatum, light amber	lb.	.02½/ .02½
Pine tar	gal.	.28
Plastogen	lb.	
Rosin oil, compounded	gal.	.40
Rubtack	lb.	.10
Tonox	lb.	
Witco Flux	gal.	.16
Solvents		
Benzol (90% drums)	gal.	$0.27
Bondogen	gal.	
Carbon bisulphide (drums)	lb	.05½/$0.12
tetrachloride	lb.	.05¼/ .06
Turpentine, steam distilled	gal.	.42 / .43
Stabilizers for Cure		
Laurex, ton lots	lb.	
Stearex B	lb.	.06½/ .08
flake	lb.	.06½/ .08
Stearic acid, dbl. pres'd	lb.	.07½/ .10
Zinc stearate	lb.	
Vulcanizing Ingredients		
Sulphur		
Chloride, drums	lb.	.03½/ .04
Flowers, extrafine refined, U.S.P.	100 lbs.	1.85 / 2.45
Rubber	100 lbs.	
Telloy	lb.	
Vandex	lb.	

(See also Colors—Antimony)

IMPORTS, CONSUMPTION, AND STOCKS


1930
1931
1932
1933
Thousands of Long Tons
INDIA RUBBER WORLD
U. S. Stocks
U. S. Consumption
U. S. Imports
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D

United States Stocks, Imports, and Consumption

United States and World Statistics of Rubber Imports, Exports, Consumption, and Stocks

Twelve Months	U. S. Net Imports* Tons	U. S. Consumption Tons	U. S. Stocks on Hand† Tons	U. S. Stocks Afloat† Tons	United Kingdom Stocks†‡ Tons	Singapore and Penang, Etc., Stocks†‡ Tons	World Production (Net Exports)‡ Tons	World Consumption Estimated‡ Tons	World Stocks†‡§ Tons
1930	488,343	375,980	200,998	56,035	118,297	45,179	821,815	684,993	366,034
1931	495,163	348,986	322,825	40,455	127,103	55,458	797,441	668,660	495,724
1932	400,787	322,000	379,000	38,360	92,567	36,802	709,860	670,250	518,187
1933									
January	31,110	22,906	385,811	32,539	89,050	35,746	63,951	52,120	521,173
February	18,875	21,638	381,794	32,898	90,172	34,354	56,056	54,900	518,166
March	27,879	18,047	390,135	29,531	.....	.....	.....	.....	.....

*Including liquid latex, but not guayule. †Stocks on hand the last of the month or year. ‡W. H. Rickinson & Son's figures. §Stocks at the 3 main centers, U. S. A., U. K., Singapore and Penang.

CONSUMPTION of crude rubber by manufacturers in the United States for March was 18,047 long tons, against 21,638 long tons (revised) for February, a decrease of 16.6% according to R.M.A. statistics. Consumption for March, 1932, totaled 27,828 long tons. For the first 3 months of 1933 consumption amounted to 62,591 long tons, compared with 85,802 long tons for same period in 1932.

Imports of crude rubber for March were 27,879 long tons, an increase of 47.7% over February, but 34.2% below March, 1932.

Total domestic stocks of crude rubber on hand March 31 are estimated at 390,135 long tons, which compares with February 28 stocks of 381,794 long tons (revised). March stocks increased 2.2% over those of February and 16.6% above the stocks of March 31, 1932.

Crude rubber afloat for the United States ports on March 31 was 29,531 long tons, against 32,898 long tons afloat on February 28, 1933, and 44,190 long tons afloat on March 31, 1932.

London and Liverpool Stocks

Week Ended	Tons London	Tons Liverpool
Apr. 1	40,845	53,989
Apr. 8	40,498	54,305
Apr. 15	40,019	54,762
Apr. 22	40,547	54,521

Price Differentials

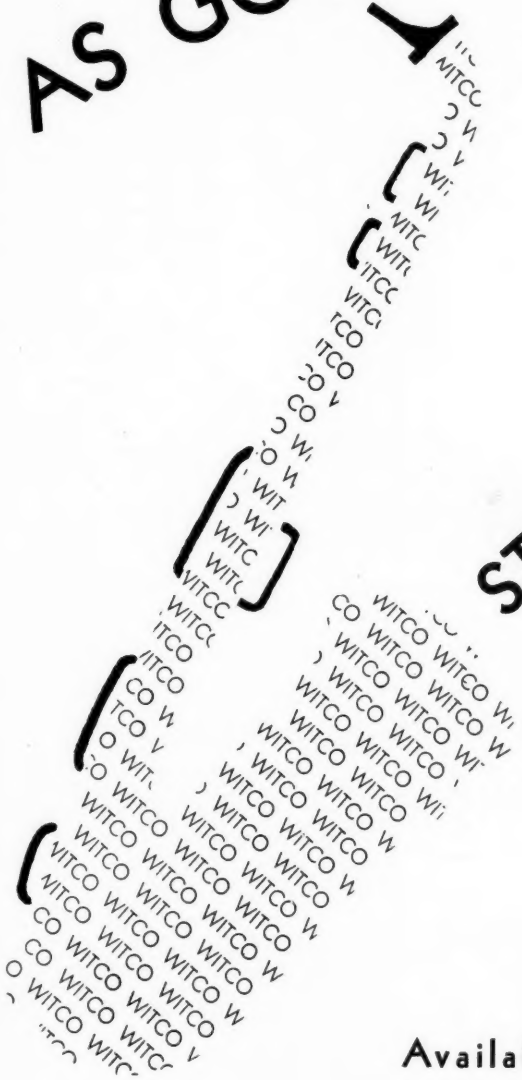
RUBBER EXCHANGE price differentials for "AB" contracts, which after May 1 will be known as "A" contracts, for May, follow:

	May Points	April Points
No. 2 Crepe (thick or thin)	1	1
No. 2 Ribbed smoked sheets	7	5
No. 3 Ribbed smoked sheets	12	10
No. 4 Ribbed smoked sheets	19	17
No. 5 Ribbed smoked sheets	52	50
Limit of allowance on No. 2 Crepe	25	25
Allowance on deliveries in bales	5	5

Improved Household Glove

RUBBER gloves for household work undoubtedly are a boon to many women who want to keep their hands soft and white. One objection to this type of protection, however, is that when the rubber becomes very wet, it also becomes slippery. To overcome this difficulty Seiberling Latex Products Co., Akron, O., now makes its rubber household gloves, known as "Firm Grip," with a crinkly effect the entire length of the 4 fingers and the tip of the thumb. This construction enables the wearer to hold objects more securely; it prevents slipping with danger to dishes.

AS GOOD AS THEY SOUND



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CARBON BLACK

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or contract basis

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Chafers and Breakers
Drills and Twills
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Osnaburg

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Randall & Stickney Rubber Thickness Gauge

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For measuring the thickness of rubber, paper, textiles and similar materials. Graduated in .001 inch (and in .01 mm when so ordered). Also supplied with weight in place of spring.

HEIGHT 7½ inches.
WEIGHT 4 lbs.
DIAL 1⅞ inches diameter, graduated 0—50.
CAPACITY ½ inch.

Standard of measurement in Rubber Factories for over forty years.

FRANK E. RANDALL, Waltham, Mass.

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Suggests Richness, Style, Quality Appearance, Long Life.

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'RMP' Antimony is entirely free from Acid, Alkali, Copper, Manganese,—will not bleed or fade, and will not affect the aging adversely.

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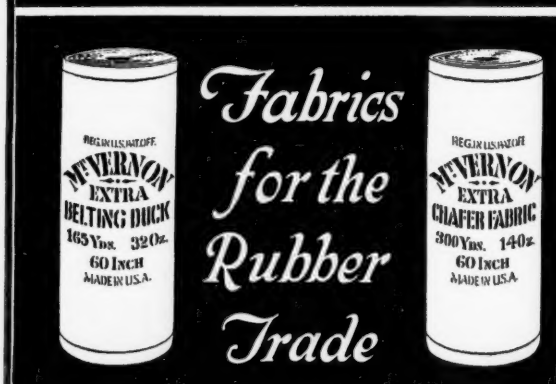
Belleville, N. J.

MT. VERNON WOODBERRY MILLS, INC.



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COTTON AND FABRICS

IN THE last 4 weeks cotton prices have risen over 1¢ a pound, carrying new deliveries over 8¢. The change in sentiment came principally from outside the market, with the gold embargo taking most of the credit. Certainly statistics of the industry do not warrant a rise.

The new crop, for instance, is expected to be larger than last year's; world takings of spinners are less than those of a year ago; exports are lagging; and the measures before Congress for farm relief will be passed too late to benefit the present crop.

The answer to these statistics seems to be in the offing, introduced by the embargo on gold. Last month sentiment in Congress veered sharply, and the possibility of the passage of uncontrolled systems of currency inflation alarmed the administration. It was then the President stepped in with the gold embargo and with his demand for complete power over inflationary measures.

What will aid business recovery more than anything else is a release of credit, a feeling of confidence by consumers, and a more stable level of commodity prices. The administration is bending its every effort toward these ends and, if given the power by Congress, may accomplish them and add to the recovery in prices which has already been effected.

Week ended April 1. The Farm Bill continued to influence adversely the market, but the market became stronger on indications that it would be amended. The administration wants to raise commodity prices; this gave confidence to the manufacturers who bought more cotton. Reports of lower cotton consumption from England and the disturbing news from Germany also unsettled the market.

Prices were shaded from 3 to 5 points below those of last week. May closed at 6.34¢, compared with 6.38¢; July 6.50 against 6.55; October 6.70 against 6.74; December 6.85 against 6.88; January 6.91 against 6.94; and March 7.04 against 7.07.

Geo. H. McFadden & Bro. in a recent bulletin said of the Farm Bill: "This bill is so bad it beggars description and defies analysis. For this reason, it seems inconceivable that it will be enacted into law, but until such time as it is disposed of in one way or another, we feel that no opinion on the future course of prices is possible."

The opposition from cotton goods houses is just as strong, because of the belief that it would involve a heavy tax on consumers, and since buying power is already restricted, the added burden would be prohibitive.

Prices were lower during the week, but on Friday, on announcement that President Roosevelt had called a conference with the Agricultural Committee, hopes were expressed that the controversial bill would be amended. Senator Thomas, of Oklahoma, was reported to have been authorized by the Committee to recommend a bill for currency expansion as a means of relieving the farmer, which point also buoyed prices.

COTTON BEAR POINTS

1. Cotton cloth sales have been held up because of the reluctance of manufacturers to sell in advance without a protecting clause against a probable tax on finished goods.
2. Forwardings to world's mills to date are about 550,000 bales behind last year.
3. Exports for the season are 900,000 bales under last season's.
4. Production of cotton cloth has been maintained at a high level with indications of overproduction in some lines.
5. Whatever form of farm relief is passed, opinion is that it will now be too late to affect this year's crop, which is 5 to 10% larger than last year's, from preliminary estimates.
6. The 30-hour-week bill now pending in Congress would decrease efficiency of mill operators and increase production costs in the opinion of many manufacturers.
7. Fertilizer sales in 8 southern states for the first 4 months of this year were 879,000 tons against 741,000 in the same time last year.

COTTON BULL POINTS

1. Indications point to a definite determination on the part of the administration in Washington for raising commodity prices.
2. Domestic consumption of cotton in March was 489,000 bales, the same as last March, despite the banking holiday.
3. The cotton spinning industry operated at 93.9% of capacity in March against 95.0% in February and 90.1% in March, 1932.
4. Heavy rains and unfavorable weather have delayed planting the new crop.
5. World consumption of American cotton in the first half of the 1932-33 season was 33⅓% greater than in the first 6 months of the 1930-31 season.
6. World production of all growths of cotton will be about 22,789,000 bales according to the Cotton Exchange Service, against 26,535,000 last season and 25,190,000, 2 seasons ago.

WEEKLY AVERAGE PRICES OF MIDDLING COTTON

Week Ended	Cents per Pound
Apr. 1	6.33
Apr. 8	6.51
Apr. 15	6.73
Apr. 22	7.23

World consumption of American cotton in February, according to the Exchange Service, was 1,095,000 bales, against 1,180,000 in January and 1,093,000 in February, 1932. For the first 7 months of the season to February 28, consumption was 7,990,000 bales against 7,219,000 in the same period a year before.

World's stocks of American cotton on March 1 were 17,967,000 bales against 18,428,000 a year before. But stocks outside of mills were estimated at 15,313,000 bales, compared with 13,565,000 a year before.

Exports are now 800,000 bales behind those of last year, showing a decline of about a third to Great Britain and about half to the Continent.

Production has declined in the cotton goods industry, but prices have been held. Dealers expect a good demand for the Easter trade, but the pressure for curtailment is still growing.

Week ended April 8. A buying move was instituted by manufacturers during the week as a result of a change in the Farm Bill and the new 30-hour law. Talks of inflation continue too, and the belief grows that the administration is trying hard to institute measures that will raise the level of commodity prices. The weather in the past week was good, and farming operations have been advanced considerably.

Prices gained from 15 to 17 points as a result of the strong trade demand. May closed at 6.49¢, compared with 6.34¢ the week before; July 6.66 against 6.50; September 6.81 against 6.65; October 6.87 against 6.70; December 7.01 against 6.85; and January 7.07 against 6.91.

The Senate Agricultural Committee during the week reported 12½¢ as the average pre-war price for cotton. Since cotton prices at present are averaging about 6¢, the report stated that an excise tax of at least 6¢ should be imposed on that part of the crop consumed in this country. About half the crop is exported; so a tax of 6¢ would net the farmer about 9¢ if the average is taken on the amount of cotton he sells for export and that he sells for domestic consumption.

Fertilizer sales in 8 states during February were 539,000 tons, according to the Cotton Exchange Service, against 426,000 last year. For the first 4 months sales were 879,000 tons, compared with 741,000 in the same time in 1932 and 1,456,000 in 1931.

Consumption of American cotton in the first half of this season was about 33⅓% greater than in the first 6 months of last year, according to the Department of Agriculture. But reports of increased acreage ranging from 5 to 10% were not so encouraging. Exports, too, are 800,000 bales lower than in last season, after being 500,000 bales ahead in the fall.

Cotton mill production in the April 1 week was 2 points lower, according to *The New York Times'* index, but the advantage gained seems only temporary. The increased demand in the last week will probably set spindles into motion again, and the fact that manufacturers will not sell ahead for May or June shipment because of the probable tax on goods will also serve to stimulate demand.

Week ended April 15. The Cotton Exchange closed Thursday night until Monday morning for the Easter holiday, but in the 4-day session the improvement in prices started last week continued, carrying quotations up by 27 to 29 points for the session. Various reasons caused the optimistic market: encouraging reports of better business from wholesale and retail sources; heavy buying of cotton goods; rainy weather that has delayed planting; reports that the Secretary of Agriculture opposed the provision for guaranteeing cost of production in the Farm Bill and the likelihood that an amended bill would be voted upon; and sympathy with a sharp rise in the wheat pit owing to estimates of a small wheat crop.

On Thursday night May closed at 6.77¢, compared with 6.49¢ the Saturday before; July 6.94 against 6.66; October 7.15 against 6.87; December 7.28 against 7.01; January 7.36 against 7.07; and March 7.49 against 7.20.

Several thousand acres of cotton land were reported under water in the Mississippi Valley because of heavy rains in Mississippi, Tennessee, and Alabama. Planting preparations had been delayed by wet fields earlier in the season; thus the crop here is well behind normal. In Texas dry top-soil conditions still prevailed. Acreage in Oklahoma is put at 10 to 20% above last year, and Fossick Bureau states that estimates of the whole acreage are crystallizing around an increase of 5 to 10%.

Domestic consumption of cotton for March was put at 489,000 bales by the New York Cotton Exchange Service, or about the same as last year.

Buying of cotton goods in the last fortnight has broadened until manufacturers feel they are enjoying a business equaled only during the Christmas holiday. Prices are firmer, and orders are being sold ahead since it is the belief that even if a law imposing an excise tax becomes effective, it will not go into force for 30 days after its enaction.

Production of cotton has eased off from the high level maintained for the last couple of months, but talks of inflation and the large buying demand may serve to turn the index back again.

Week ended April 22. The heaviest cotton buying in years featured the market Wednesday when the gold embargo on exports was declared by the United States. Sharp fluctuations of the price of sterling and the spread of prices here and at Liverpool caused large arbitrage operations which added to the volume.

After the Easter Holiday Monday's prices sold off on realizing sales. Tuesday the market advanced on buying from commission houses, influenced by reports that all inflationary measures had been removed from the Farm Bill. News of the gold embargo gave new impetus to the market, with prices rising 39 to 42 points on Wednesday alone. The new-crop cotton climbed over the 8¢ quotation on a wide movement. Profit-taking erased Friday's gains, but the market strengthened at the week-end in the belief that the administration's request for broad powers for adjustment of the currency would pass Congress.

For the week, gains were 63 to 70 points. May closed at 7.42¢, compared with 6.77¢ the Thursday before; July 7.59 against 6.94; September 7.74 against 7.08; October 7.80 against 7.15; December 7.98 against 7.28; and March 8.12 against 7.49.

Statistics released during the week showed that exports were now about 900,000 bales behind last year; spinners' takings were about 600,000 bales under those of a year ago; and cotton cloth production was being maintained at the level of recent weeks.

Cotton goods were sold slowly last week owing to the holiday and uncertainty over farm legislation, but prices held firm.

Buying which had accumulated over the week-end raised prices on the cotton market 13 to 24 points at the opening on the 24th. Profit taking erased most of the gains, but for the day quotations were from 1 to 8 points up.

May was 7.42/7.50; July 7.65/7.67; October 7.87/7.89; December 8.00/8.03; and January 8.09/8.12.

On April 25, New York spot middling cotton was 7.60¢, 5 points off. There were no sales or contract deliveries.

Cotton Fabrics

DUCKS, DRILLS, AND OSNABURGS. Consumers and jobbers are taking a lively interest in their textile position. The price situation has become decidedly firmer since March. There is a great demand for textiles at lower, but steadily advancing prices. Sellers are limiting contract sales by specifying deliveries not later than May and June.

RAINCOAT FABRICS. Spring trade greatly increased and manufacturers are doing a very good business at the present time and are planning for the Autumn trade. It is expected that the raincoat business will be very active for the remainder of the year.

SHEETINGS. The market has moved in sympathy with rather a brisk demand by the trade owing to the rise in commodity prices that has taken place within the past few days.

TIRE FABRICS. The prices of all grades held nominal and unchanged. The inflationary movement has served to eliminate any instances of lower prices that previously existed.

New York Quotations

April 25, 1933

		Cents
Drills		
38-inch 2.00-yard	yd.	$0.08⅝
40-inch 3.47-yard		.05⅛
50-inch 1.52-yard		.11⅞
52-inch 1.90-yard		.09¾
52-inch 2.20-yard		.09⅛
52-inch 1.85-yard		.10
Ducks		
38-inch 2.00-yard D. F.	yd.	.08⅝
40-inch 1.45-yard S. F.		.11¾
72-inch 1.05-yard D. F.		.17
72-inch 16.66-ounce		.17¾
72-inch 17.21-ounce		.18¾
MECHANICAL		
Hose and belting	lb.	.20½
TENNIS		
52-inch 1.35-yard	yd.	.13½
Hollands		
GOLD SEAL		
40-inch No. 72	yd.	.14
RED SEAL		
36-inch	yd.	.11
40-inch		.11½
50-inch		.17½
Osnaburgs		
40-inch 2.34-yard	yd.	.07½
40-inch 2.48-yard		.07
40-inch 3.00-yard		.05¾
40-inch 10-ounce part waste		.09½
40-inch 7-ounce part waste		.06⅞
37-inch 2.42-yard		.07⅛
Raincoat Fabrics		
COTTON		
Bombazine 60 x 64	yd.	.07½
Bombazine 60 x 48		.07
Plaids 60 x 48		.07½
Plaids 48 x 48		.06¾
Surface prints 60 x 64		.08¾
Surface prints 60 x 48		.08¼
Print cloth, 38½-inch, 64 x 60		.03⅞
Print cloth, 38½-inch, 60 x 48		.03½
SHEETINGS, 40-INCH		
48 x 48, 2.50-yard	yd.	.05½
48 x 48, 2.85-yard		.05
64 x 68, 3.15-yard		.05½
56 x 60, 3.60-yard		.04¾
44 x 48, 3.75-yard		.04¼
44 x 40, 4.25-yard		.03⅞
SHEETINGS, 36-INCH		
48 x 44, 5.00-yard	yd.	.03⅜
44 x 40, 6.15-yard		.02⅞
Tire Fabrics		
BUILDER		
17¼ ounce 60" 23/11 ply Karded peeler	lb.	.23
17¼ ounce 60" 10/5 ply Karded peeler	lb.	.19
CHAFER		
14 ounce 60" 20/8 ply Karded peeler	lb.	.23
12 ounce 60" 10/4 ply Karded peeler	lb.	.19
9¼ ounce 60" 20/4 ply Karded peeler	lb.	.25
9¼ ounce 60" 10/2 ply Karded peeler	lb.	.19
CORD FABRICS		
23/5/3 Karded peeler, 1 1/16" cotton	lb.	.24¼
23/4/3 Karded peeler, 1 1/16" cotton	lb.	.25½
15/3/3 Karded peeler, 1 1/16" cotton	lb.	.22¼
13/3/3 Karded peeler, 1 1/16" cotton	lb.	.21¼
7/2/2 Karded peeler, 1 1/16" cotton	lb.	.20½
23/5/3 Karded peeler, 1¼" cotton	lb.	.30½
23/5/3 Karded Egyptian, Egyptian upper cotton	lb	.36¼
23/5/3 Combed Egyptian	lb.	.41½
LENO BREAKER		
8¼ ounce and 10¼ ounce 60" Karded peeler	lb.	.23

Crude Rubber

(*Continued from page* 58)

Trading Co. of Amsterdam. The Rubber Growers' Association took care to disclaim any part in the first scheme, and no comment was forthcoming from official quarters on the other. The feeling persists, however, that something is in the wind.

Certainly the statistical position of rubber furnishes no basis for an advance in prices. Dealers' stocks in Malay on March 31 were 30,855 tons, dry, compared with 28,622 in February and 47,557 for March, 1932.

Consumption of crude rubber during March by manufacturers in the United States totaled 18,047 long tons, compared with 21,638 long tons in February this year, and is 16.6% lower. March, 1932, consumption amounted to 27,828 long tons. For the first quarter of 1933, consumption was 62,591 long tons against 85,802 long tons for the same period of 1932. Imports to the United States for March totaled 27,879 long tons, an increase of 47.7% over February, but 34.2% less than March, 1932.

Pneumatic casings shipped in February amounted to 2,292,463 units, a drop of 11.7% under January and 10.2% below February, 1932. Production was 2,339,373 casings for the month, 3.6% over January, but 39.6% under February, 1932. Tires on hand were 7,376,946 units, 1.9% over January 31, but 19.6% under February 29, 1932.

Automobile production, slowly climbing upward, was at a level last week equal to that prevailing before the bank holiday. Increased schedules were put into force by the low priced manufacturers, with Chevrolet producing 9,000 units, Ford 7,500, and Plymouth 6,000. Retail sales, reported better in March than in February, for the first 3 months were only 2% under the same period in 1932, despite banking difficulties.

Price advances were scored in the Outside Market, but the volume of business was little changed. Dealers bought some rubber, and there was some factory business, but the flurry of buying which characterized the Exchange was largely for speculative account and not participated in as yet by factories.

(*Concluded on page* 68)

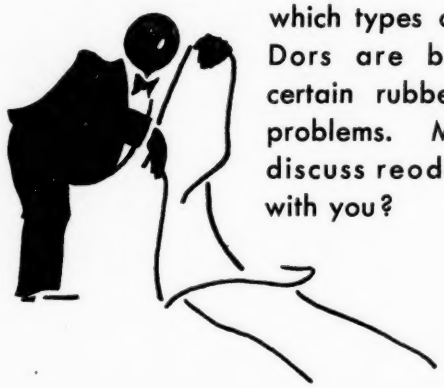
does it SMELL ?

If rubber goods have that "rubbery" smell, the manufacturer will lose an order. . .for buyers know how smell affects rubber sales these days. Be sure your products are free from odor. Treat them with

PARA - DORS

These are aromatic chemicals for counteracting odor in rubber compounds. There is a Para-Dor for every type of rubber. . . and in different qualities, and covering a wide price range.

We have made thorough tests with these aromatics in rubber compounds; we know what they will accomplish—which types of Para-Dors are best for certain rubber-smell problems. May we discuss reodorizing with you?



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Industrial Aromatics Division
80 Fifth Avenue, New York, N. Y.

Regular and Special Constructions
of
COTTON FABRICS

Single Filling Double Filling
and
ARMY
Ducks

HOSE and BELTING
Ducks

Drills

Selected
Osnaburgs

Curran & Barry
320 BROADWAY
NEW YORK

Crude Rubber

(*Concluded from page 66*)

Nearbys closed at 3¼¢, compared with 3 7/16 the week before; May-June 3⅞ against 3⅛; July-September 3 11/16 against 3 7/16; and October-December 4⅛ against 3 7/16.

Week ended April 22. More exciting times were seen on the Rubber Exchange in the last week than in the brightest days of 1929. On Wednesday, when the United States declared an embargo on gold, transactions in rubber totaled 10,610 long tons with a value of about $1,000,000. It was the largest amount of rubber ever sold on the Exchange in one day and surpasses the previous record of 9,717 tons in January, 1929.

Price fluctuations were equally sensational. Gains on Wednesday were as much as 81 to 85 points and closed at gains of 41 to 45 points; on Thursday gains climbed 64 to 74 points, and then under heavy selling orders dropped from 60 to 101 points, on a turnover of 7,050 long tons. The market lost ground on Friday under profit taking. A highly erratic market on Saturday saw prices on some positions unchanged, on others up a few points, and down on the rest.

For the week prices were 8 points down to 10 points up. May closed at 3.63¢, compared with 3.71¢ before the holiday; July 3.89 against 3.85; September 4.03 against 3.94; October 4.06 against 3.99; December 4.11 against 4.07; and March 4.24 against 4.14.

Developments at Washington had much to do with the activity on the week's market. Talks of inflation led speculators to buy heavily, and many Wall Street houses were reported in the market. One large banking and brokerage house that had not been active in rubber for some time was said to have been responsible for half the volume on the 10,000-ton day. The impression is also gaining that no matter what form legislation takes, the administration is determined to raise commodity prices.

A boost was also provided for speculators by the renewed talk of restriction in the Far East. A cable said that the Dutch Colonial Minister was drafting a plan for submission to the British. In talking to the parliament, the Dutch Minister said that "obligatory restriction of rubber is desirable, as soon as it is possible to draft a practical and useful plan which would be applicable to the British and to native cultivation."

Activity in the Outside Market, while not equal to that on the Exchange, improved over previous weeks. Factories, fearing that the effect of supposed inflationary measures will increase prices, were in the market buying rubber to protect themselves. Buying, of course, came from the smaller firms on a hand-to-mouth basis. The large factories still have plenty of rubber.

May-June was quoted at 3 7/16¢ at the close, unchanged from the previous Thursday; July-September 4⅛ against 3 11/16; and October-December 4¼ against 4⅛.

Speculative activity in a quiet market on Monday, April 24, raised prices on the Exchange from 48 to 50 points. No definite information has been received as yet on restriction.

Closing prices follow: April, 4.10¢; May, 4.12-4.16¢; July, 4.40; September, 4.48; October, 4.55; and December, 4.64.

The Outside Market showed little activity, but prices were better by about ½¢. May-June, ribbed smoked sheets were quoted at 4¼-4⅜; July-September, 4½; October-December, 4¼; and January-March, 4⅞.

Futures declined moderately on April 25, owing to absence of factory interest. Outside market prices were also lower at 4⅛¢ basis. April standard ribs, 1/10¢ easier, were quoted at 4 15/16¢.

Rims Approved by The Tire & Rim Association, Inc.

Rim Size	3 Mos., 1933 No.	3 Mos., 1933 %	3 Mos., 1932 No.	3 Mos., 1932 %
Motorcycle Rim				
24x3	475	0.0	253	0.0
Clincher Rims				
30x3½	933	0.1	4,678	0.2
Drop Center Rims				
16x3.62F	.....	...	20	0.0
17x3.00D	264,337	16.0	.....	...
17x3.25E	214,678	13.0	87,773	4.0
17x3.62F	434,587	26.3	268,320	12.3
17x4.00F	90,659	5.5	6,041	0.3
17x4.19F	10,143	0.6	52,786	2.4
18x2.15B	8,661	0.5	4,196	0.2
18x3.00D	142,668	8.6	690,909	31.6
18x3.25E	45,988	2.8	487,559	22.3
18x3.62F	1,697	0.1	59,500	2.7
18x4.00F	1,990	0.1	54,829	2.5
18x4.19F	8,765	0.5	31,481	1.4
19x2.15B	.....	...	5,416	0.2
19x3.00D	8,033	0.5	29,883	1.5
20x2.75D	.....	...	123	0.0
Semi Drop Base Split Rims				
17x3.62F	.....	...	9,981	0.5
19x3.00D	.....	...	10,468	0.5
Flat Base Balloon Rims				
17x4	.....	...	8,246	0.4
17x4½	.....	...	8,636	0.4
17x5	1,359	0.1	844	0.0
18x4	1,257	0.1	3,444	0.1
18x4½	110	0.0	91	0.0
18x5	3,723	0.2	1,447	0.1
19x2.75D	2,327	0.1	.....	...
19x3.00D	153	0.0	.....	...
19x4	3,747	0.2	6,201	0.3
19x4½	1,054	0.1	3,069	0.1
19x5	262	0.0	1,753	0.1
20x2.75D	4,036	0.2	6,071	0.3
20x3½	602	0.0	5,050	0.2
20x4	501	0.0	1,730	0.1
20x4½	236	0.0	609	0.0
20x5	303	0.0	6,753	0.3
21x2.75D	448	0.0	488	0.0
21x3½	1,566	0.1	5,462	0.3
21x4	401	0.0	1,969	0.1
21x4½	984	0.1	1,205	0.1
21x6	97	0.0	500	0.0
32x4	201	0.0	558	0.0
34x4½	211	0.0	258	0.0
18" Truck Rims				
18x5	284	0.0	621	0.0
18x7	1,020	0.1	2,704	0.1
18x8	147	0.0	126	0.0
20" Truck Rims				
20x5	170,109	10.3	223,413	10.2
20x6	44,488	2.7	42,737	1.9
20x7	18,292	1.1	15,332	0.7
20x8	6,930	0.4	14,583	0.7
20x9/10	431	0.0	1,063	0.0
20x10.50	202	0.0	92	0.0
20x11	.....	...	199	0.0
22" Truck Rims				
22x7	91	0.0	349	0.0
22x8	1,227	0.1	1,077	0.0
22x9/10	105	0.0	2,091	0.1
24" Truck Rims				
24x6	359	0.0	535	0.0
24x7	1,698	0.1	2,970	0.1
24x8	2,790	0.2	5,962	0.3
24x9/10	1,305	0.1	2,247	0.1
24x11	.....	...	233	0.0
Drop Center Tractor Rims				
24x8.00	1,685	0.1	.....	...
28x8.00	915	0.1	.....	...
36x6.00	348	0.0	.....	...
Low Pressure Balloon Rims				
15x5.00E	15,474	0.9	.....	...
15x5.50E	8,101	0.5	.....	...
16x3.50D	65	0.0	.....	...
16x4.00D	99,561	6.0	.....	...
16x4.50D	17,091	1.0	.....	...
16x5.00E	323	0.0	.....	...
16x5.50E	187	0.0	.....	...
16x6.00E	548	0.0	.....	...
1934 Lineup				
16x4.50E	2,884	0.2	.....	...
Totals	1,653,852	...	2,184,934	...

Passenger Car Tire Sizes

MAKE AND MODEL		Tire Size (Int.)	Engine Mounting
Auburn	8-101, 8-105	6.00/17	RFR..
Auburn	12-161, 12-165	6.00/17	RFR..
Austin		3.75/18	Ri....
Buick	33-50	6.00/17	RFR..
Buick	33-60	6.50/17	RFR..
Buick	33-80, 33-90	7.00/17	RFR..
Cadillac	355-C	7.00/17	RFR..
Cadillac	370-C	7.50/17	RFR..
Cadillac	452-C	7.50/17	RFR..
Chevrolet		5.25/18	RFR..
Chrysler	Six	5.50/17	Fp....
Chrysler	Royal 8	6.00/17	Fp....
Chrysler	Imp. 8	6.50/17	Fp....
Chrysler	Imp. Cus. 8	7.50/17	Fp....
Continental	C-400	5.25/17	RFR..
Continental	C-600	5.25/17	RFR..
Continental	Big 6	5.50/17	RFR..
Cord	L-29	7.00/18	Ri....
Cunningham	V-10	7.00/19	RFR..
DeSoto	Six	5.50/17	Fp....
Dodge	Six	6.00/16	Fp....
Dodge	Eight	6.50/17	Fp....
Duesenberg	J	7.00/19	RFR..
du Pont	G	7.00/20	RFR..
Essex Terraplane	6	5.25/17	RFR..
Essex Terraplane	8	6.00/16	RFR..
Ford	8	5.25/18	RFR..
Ford	4	5.25/18	RFR..
Franklin	Series 16	6.50/19	RR...
Franklin	Series 17	7.50/17	RR...
Franklin	Series 18	6.00/17	RR...
Graham	Std. 6	5.50/17	RFR..
Graham	Eight	6.00/17	RFR..
Hudson	Super 6	5.50/17	RFR..
Hudson	8	6.00/17	RFR..
Hupmobile	321	6.00/17	RFR..
Hupmobile	322	6.00/17	RFR..
Hupmobile	326	6.50/17	RFR..
La Salle	345-C	7.00/17	RFR..
Lincoln	V-12-136	7.00/18	RFR..
Lincoln	V-12-145	7.50/18	RFR..
Marmon	16	7.00/18	RFR..
Nash	Big 6	5.50/17	RFR..
Nash	Std. 8	5.50/17	RFR..
Nash	Spec. 8	5.50/18	RFR..
Nash	Adv. 8	6.50/17	RFR..
Nash	Ambas. 8	.....	RFR..
Oldsmobile	F-33	5.50/17	RFR..
Oldsmobile	L-33	6.00/17	RFR..
Packard	8	7.00/17	RFR..
Packard	Super 8	7.00/17	RFR..
Packard	12	7.50/17	RFR..
Pierce-Arrow	836	7.00/17	RFR..
Pierce-Arrow	1236	7.00/17	RFR..
Pierce-Arrow	1247-1242	7.50/17	RFR..
Plymouth	1933	5.25/17	Fp..
Pontiac	8	5.50/17	...
Reo S		6.00/17	RR...
Reo	Royale	6.50/18	RR...
Rockne	Six	5.25/18	RFR..
Studebaker	Six-56	5.50/17	RFR..
Studebaker	Com. 73	6.00/17	RFR..
Studebaker	Pres. 82	7.00/17	RFR..
Studebaker	Pres. 92	6.50/17	RFR..
Stutz	LAA	6.00/19	RR...
Stutz	CS, SV16	7.00/18	Ri..
Stutz	CS, SV16	7.00/18	Ri..,
Stutz	CD, DV32	7.00/18	RR..
Stutz	CD, DV32	7.00/18	RR...
Willys	77	5.00/17	Fp....
Willys	99	5.50/17	Fp....
Willys-Knight	66E	6.00/17	RFR..

Fp—Floating Power
Ri—Rigid
RFR—Rubber Front and Rear
RR—Rubber Rear

From *Automotive Industries*

CLASSIFIED ADVERTISEMENTS

SITUATIONS WANTED

GENERAL FOREMAN. PRACTICAL MAN WITH 12 YEARS OF experience in rubberizing all kinds of fabrics, both single and double textures, raincoat materials, and suede cloth. Complete knowledge of calender, mill room, spreading, curing, and compounding. Thoroughly understands the working of all equipment. Address Box No. 197, care of INDIA RUBBER WORLD.

MAN, TWENTY-EIGHT, 6 YEARS' BROAD, PRACTICAL, AND technical experience in rubber industry with large companies. Knowledge compounding. Address Box No. 198, care of INDIA RUBBER WORLD.

CALENDER AND MILL ROOM FOREMAN, THOROUGH PRACtical experience on mechanicals, tires and tubes. Efficient manager with executive ability. At present employed in responsible position with large rubber company. Desires new permanent connection. Best of reasons for seeking change. A-1 references from past and present employers. Would go abroad. Address Box No. 199, care of INDIA RUBBER WORLD.

FACTORY MANAGER AND DEVELOPMENT ENGINEER, WITH past record of accomplishment and mature experience in hard rubber manufacture and merchandising. Can introduce refinements in present manufacture and introduce new lines. Also knowledge of soft mechanical lines. Address Box No. 203, care of INDIA RUBBER WORLD.

MECHANICAL ENGINEER: 15 YEARS' EXPERIENCE RUBBER footwear and mechanicals. Plant maintenance, power, developments. Acquainted with latest equipment for rubber footwear and tennis. Address Box No. 204, care of INDIA RUBBER WORLD.

CHEMIST, B.SC., WITH EXPERIENCE IN TESTING, COMPOUNDing, processing, and factory control. Wide experience in chemical lines. Address Box No. 205, care of INDIA RUBBER WORLD.

MECHANICAL GOODS SALESMAN OR EXECUTIVE: 20 YEARS' experience various middle and western territories as salesman, branch and district manager. Thorough knowledge and experience in all mechanicals, hard rubber, rolls, flooring. Open for connection offering permanence and satisfactory income. Can control substantial profitable volume and give unexcelled references from trade and others. Personal interview solicited. Address Box No. 206, care of INDIA RUBBER WORLD.

FACTORY MANAGER AND DEVELOPMENT MAN, EXPERIENCED in both soft and hard rubber mechanicals, calenders, mills, and presses. Knowledge of compounding. Reputed excellent handler of men. Address Box No. 207, care of INDIA RUBBER WORLD.

AGE 35, EDUCATED U. OF PA., 12 YEARS' EXPERIENCE COST accounting, design, production, merchandising, and advertising mechanicals, brake linings; leading companies. Resultful sales letters, copy, layouts. Willing to go abroad. Address Box No. 208, care of INDIA RUBBER WORLD.

CHEMIST AND FACTORY MANAGER, AGE 35, OPEN FOR CONnection with small concern. Highly experienced in mechanicals, sponge rubber, sport soles, heels, druggists' sundries, plumbing supplies, and specialties of all kinds. A-1 references. Go anywhere; moderate salary. Address Box No. 209, care of INDIA RUBBER WORLD.

TIME STUDY AND WAGE INCENTIVE MAN, 12 YEARS' experience in modern manufacturing production methods, especially extruded and molded rubber products, reclaimed rubber, etc., would like connection with manufacturer desiring installation of piece work or bonus system. Thorough knowledge cost compilation, sales methods, etc. Excellent record of accomplishment. Reasonable compensation requirements. Address Box No. 212, care of INDIA RUBBER WORLD.

MR. RUBBER MANUFACTURER!

The manufacture of golf balls is a very profitable item and offers the least saturated market open to the rubber trade. What could you do with the profits available from a modern, efficient golf ball unit? What could you do with the saving in overhead in the rest of your plant which the addition of such a unit would produce? Facts and figures free.

PLANT INSTALLATION AND OPERATION
PROCESSES FORMULAS EQUIPMENT DEVELOPMENT

I. T. GURMAN, CONSULTANT
CHEMICAL, MECHANICAL & INDUSTRIAL ENGINEERING
GOLF BALL SPECIALIST
1 WYETH STREET MALDEN, MASS.

WE maintain a complete modern rubber plant and are in a position to undertake the manufacture of practically any moulded rubber article for the trade.

A. W. FABER, INC.
NEWARK, N. J. • 1761-1933

We shall be pleased to consult with you on your rubber problems. Estimates cheerfully furnished.

BROCKTON TOOL COMPANY
103 BELMONT STREET **QUALITY HEEL MOULDS** BROCKTON, MASS.
MOULDS FOR PLAIN AND SPORT SOLES — MECHANICAL GOODS AND SPECIALTIES

Rebuilt and New Rubber Mill Machinery of Every Type
GUARANTEED EQUIPMENT — PROMPT SHIPMENT
FACTORY OUTFITTERS FROM A BOLT TO A COMPLETE PLANT
Engineering and Erecting Service

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TRENTON, N. J.
AKRON, OHIO
COMPTON, CALIF.

MAIN OFFICE—TRENTON, N. J.

CABLE ADDRESS
ALBERTSON
TRENTON

We Carry the Largest Stock in the World

(*Advertisements continued on page* 71)

United States Statistics

Imports of Crude and Manufactured Rubber

	January, 1932		January, 1933	
	Pounds	Value	Pounds	Value
UNMANUFACTURED—*Free*				
Crude rubber	74,414,859	$3,387,505	66,801,222	$2,213,828
Liquid latex	742,235	40,613	1,882,928	100,900
Jelutong or pontianak	1,418,724	81,396	800,063	40,586
Balata	121,650	14,095	74,039	7,815
Gutta percha	33,535	6,062	64,636	5,058
Siak, scrap, and reclaimed	448,473	5,856	256,135	1,176
Totals	77,179,476	$3,535,527	69,879,023	$2,369,363
Chicle, crude *Free*	214,320	$96,923	402,109	$115,745
MANUFACTURED—*Dutiable*				
Rubber soled footwear with fabric uppers *pairs*	.....	.....	465,682	$60,445
Rubber toys	.....	.....	.....	34,264
Druggists' sundries, n. e. s.	.....	.....	.....	6,694
Combs, hard rubber *number*	.....	.....	637,238	17,588
Golf balls *number*	.....	.....	11,196	2,787
Tennis and other rubber balls *number*	.....	.....	214,624	7,116
Tires *number*	940	$5,150	14,416	67,781
Other rubber manufactures	.....	48,611	.....	31,591
Totals	.....	$53,761	.....	$228,266

Exports of Foreign Merchandise

RUBBER AND MANUFACTURES				
Crude rubber	3,570,828	$185,466	3,211,106	$111,811
Balata	6,048	1,062	12,729	2,595
Gutta percha, rubber substitutes, and scrap	50	45	.....	.....
Rubber manufactures	.....	92	.....	469
Totals	.....	$186,665	.....	$114,875

Exports of Domestic Merchandise

RUBBER AND MANUFACTURES				
Reclaimed	1,065,109	$45,649	291,355	$8,906
Scrap and old	4,161,924	71,790	2,913,124	42,653
Rubberized automobile cloth, *sq. yd.*	50,449	18,641	45,426	20,166
Other rubberized piece goods and hospital sheeting *sq. yd.*	54,120	17,581	39,204	14,859
Footwear				
Boots *pairs*	27,676	59,021	5,445	10,266
Shoes *pairs*	15,747	11,285	6,882	4,592
Canvas shoes with rubber soles *pairs*	19,040	11,659	15,238	8,857
Soles *doz. pairs*	3,000	6,116	829	2,112
Heels *doz. pairs*	33,239	21,329	27,998	16,002
Water bottles and fountain syringes *number*	13,233	4,685	11,033	3,765
Gloves *doz. pairs*	4,882	10,947	3,558	7,395
Other druggists' sundries	.....	27,654	.....	21,350
Balloons *gross*	29,303	23,013	19,789	18,111
Toys and balls	.....	1,826	.....	1,967
Bathing caps *doz.*	1,050	2,056	2,297	4,134
Bands	28,324	9,008	14,549	4,075
Erasers	17,033	10,649	20,598	12,126
Hard rubber goods				
Electrical goods	112,890	11,903	72,733	6,530
Other goods	.....	7,242	.....	3,984
Tires				
Truck and bus casings, *number*	16,493	256,627	8,856	146,482
Other automobile casings, *number*	50,971	389,658	61,664	444,184
Tubes, auto *number*	53,039	60,786	38,666	38,129
Other casings and tubes, *number*	1,402	3,881	1,355	3,372
Solid tires for automobiles and motor trucks *number*	631	16,367	432	11,585
Other solid tires	183,411	21,516	55,866	5,997
Tire sundries and repair materials	.....	36,884	.....	25,545
Rubber and friction tape	81,360	18,155	35,739	8,561
Belting	149,448	60,112	137,714	61,594
Hose	260,189	67,197	171,241	41,357
Packing	79,843	32,647	58,355	23,576
Thread	100,299	60,753	142,216	76,639
Other rubber manufactures	.....	80,431	.....	66,979
Totals	.....	$1,477,068	.....	$1,165,850

London Stocks, February, 1933

			Stocks, February 28		
LONDON	Landed Tons	Delivered Tons	1933 Tons	1932 Tons	1931 Tons
Plantation	3,273	2,576	37,127	65,902	82,168
Other grades	4	.....	55	40	50
LIVERPOOL					
Plantation	*2,144	*1,723	*52,990	*60,016	*44,656
Total tons, London and Liverpool	5,421	4,299	90,172	125,958	126,874

*Official returns from the recognized public warehouses.

Rubber Goods Production Statistics

	1932 Total	1932 January	1933 January
TIRES AND TUBES			
Pneumatic casings			
Production *thousands*	32,067	2,770	1,806
Shipments, total *thousands*	32,440	2,602	2,077
Domestic *thousands*	31,639	2,545	2,011
Stocks, end of month *thousands*	73,395	6,329	5,789
Solid and cushion tires	[illegible]	[illegible]	[illegible]
Production *thousands*	100	9	6
Shipments, total *thousands*	107	9	7
Domestic *thousands*	103	9	7
Stocks, end of month *thousands*	350	37	22
Inner tubes			
Production *thousands*	29,514	2,719	1,675
Shipments, total *thousands*	30,507	2,803	2,028
Domestic *thousands*	29,960	2,761	1,989
Stocks, end of month *thousands*	68,803	6,175	4,957
Raw material consumed			
Fabrics *thous. of lbs.*	128,980	12,156	7,899
MISCELLANEOUS PRODUCTS			
Rubber bands, shipments *thous. of lbs.*	2,398	206	189
Rubber clothing, calendered			
Orders, net *no. coats and sundries*	195,921	20,720	11,574
Production *no. coats and sundries*	263,786	10,130	24,409
Rubber-proofed fabrics, production, total *thous. of yds.*	33,232	2,184	2,052
Auto fabrics *thous. of yds.*	3,354	339	221
Raincoat fabrics *thous. of yds.*	15,935	853	799
Rubber flooring, shipments *thous. of sq. ft.*	4,764	349	188
Rubber and canvas footwear	[illegible]	[illegible]	[illegible]
Production, total *thous. of pairs*	47,764	3,557	3,725
Tennis *thous. of pairs*	26,543	2,496	1,913
Waterproof *thous. of pairs*	21,222	1,061	1,812
Shipments, total *thous. of pairs*	54,299	3,990	3,156
Tennis *thous. of pairs*	28,705	2,374	1,814
Waterproof *thous. of pairs*	25,595	1,616	1,342
Shipments, domestic, total *thous. of pairs*	53,677	3,962	3,136
Tennis *thous. of pairs*	27,913	2,353	1,801
Waterproof *thous. of pairs*	25,413	1,610	1,335
Stocks, total, end of month *thous. of pairs*	209,957	20,237	15,351
Tennis *thous. of pairs*	75,410	8,510	7,008
Waterproof *thous. of pairs*	134,549	11,726	8,343
Rubber heels			
Production *thous. of pairs*	155,243	12,316	13,142
Shipments, total *thous. of pairs*	157,557	12,425	11,336
Export *thous. of pairs*	3,095	290	209
Repair trade *thous. of pairs*	45,436	3,431	2,433
Shoe manufacturers *thous. of pairs*	109,027	8,704	8,694
Stocks, end of month *thous. of pairs*	298,608	24,515	21,808
Rubber soles			
Production *thous. of pairs*	41,646	3,411	4,247
Shipments, total *thous. of pairs*	41,452	3,226	3,777
Export *thous. of pairs*	71	8	1
Repair trade *thous. of pairs*	2,599	264	275
Shoe manufacturers *thous. of pairs*	38,784	2,954	3,502
Stocks, end of month *thous of pairs*	28,572	2,085	2,766
Mechanical rubber goods, shipments			
Total *thous. of dollars*	27,699	2,463	2,060
Belting *thous. of dollars*	5,677	483	382
Hose *thous. of dollars*	11,078	903	730
Other *thous. of dollars*	10,945	1,077	949

Source: *Survey of Current Business*, Bureau of Foreign & Domestic Commerce, Washington, D. C.

Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

No.	COMMODITY	CITY AND COUNTRY
*†3,516	Electric attachment rubber plugs and caps, and electric connectors	Winnipeg, Canada
*†3,524	Chewing gum in tablet form	Brussels, Belgium
*†3,541	Surgical gloves, etc	Istanbul, Turkey
*3,556	Battery containers	Caracas, Venezuela
*3,581	Rubber heel making machinery	Guatemala City, Guatemala
*†3,589	Rod and piston packings	Milan, Italy
*†3,590	Shoes	Manila, Philippine Islands
*3,605	Truck tires and tubes	Antofagasta, Chile
*†3,686	Elastic webbing looms	London, England
*†3,695	Tennis balls	Medan, Sumatra
*†3,702	Rubberized automobile top material	Buenos Aires, Argentina
*3,721	Druggists' sundries	Oruro, Bolivia
†3,794	2-Way elastic corset webbing	Stockholm, Sweden
*3,801	Zinc oxide, calcium carbonate, magnesium carbonate, and kaolin for use in manufacturing rubber heels	Barranquilla, Colombia
*3,815	Old tires	Hong Kong, China
‡3,816	Raincoats	London, England
*†3,873	Heels	Medan, Sumatra
*†3,878	Belting	Bucaramanga, Colombia
*†3,889	Bathing caps	Prague, Czechoslovakia
*†3,893	Rubber sundries and specialties	Mexico, Mexico
*†3,907	Household sundries	Aneon, Panama
‡3,938	Rubber bands	Alexandria, Egypt
*3,960	Sheeting	Liverpool, England
‡3,970	Druggists' sundries	Dar-es-Salaam, British East Africa

*Purchase. †Agency. *†Purchase or agency. ‡Purchase and agency, or either.

ERNEST JACOBY

Crude Rubber
Liquid Latex
Carbon Black
Clay

Stocks of above carried at all times

BOSTON MASS.
Cable Address: Jacobite Boston

Classified Advertisements

CONTINUED

SITUATIONS WANTED—Continued

SITUATION WANTED: MANUFACTURERS' REPRESENTATIVE mechanical rubber goods or rubber products for Chicago and vicinity. References furnished. Address Box No. 213, care of INDIA RUBBER WORLD.

EXECUTIVE POSITION WANTED IN THE EAST BY A SUPERintendent for years in charge of a plant making a full line of rubber clothing and responsible for the rubberizing of necessary fabrics. Conservative, dependable, and progressive. Management with a wide experience in developing new materials and processes commend this executive. Address Box No. 214, care of INDIA RUBBER WORLD.

SITUATION OPEN

CHEMIST AND COMPOUNDER WANTED FOR FACTORY MAKing mechanical rubber goods. Give full details in first letter as to type of experience, salary expected, etc. Address Box No. 210, care of INDIA RUBBER WORLD.

BUSINESS OPPORTUNITIES

INVENTORS: A GOING MANUFACTURING AND SALES COMpany is interested in financing and promoting new developments in the rubber industry. Address Box No. 201, care of INDIA RUBBER WORLD.

WANTED: A MATERIAL TO BE USED EITHER IN SOLUTION or otherwise, which will not only prevent molded rubber articles from sticking to the mold, but will impart at the same time a maximum of dry glossiness to the surfaces of the articles. Address Box No. 202, care of INDIA RUBBER WORLD.

WANTED: RUBBER MANUFACTURING PLANT

Old established, highly rated concern desires to rent part or all of a RUBBER FACTORY full yequipped to manufacture molded rubber goods; within radius hundred miles of New York, but outside New York city limits. Address Box No. 211, care of INDIA RUBBER WORLD.

MACHINERY AND SUPPLIES FOR SALE

FOR SALE: ONE 18 BY 54" BIRMINGHAM 4-ROLL CALENDER; one unused 18 by 30" heavy duty Farrel mill, chain drive; complete line of W. & P. mixers, vacuum shelf driers, calenders, mills, colloid mills, pebble mills, dough mixers, hydraulic presses, pumps, etc. Rebuilt, guaranteed. What machinery have you for sale? CONSOLIDATED PRODUCTS CO., INC., 13-16 Park Row, New York, N. Y.

FOR SALE: ONE NEW HYDRAULIC AUTOCLAVE PRESS PAN, 5' 6" diameter, with mold space 12', suitable for working steam pressure of 60 lbs. per sq. in.; ram 24" diameter, working in cast steel cylinder, for hydraulic working pressure of 1,700 lbs. per sq. in.; inlet, outlet, and water connections fitted; head supported by 4 steel columns; bayonet-type-joint lid and outside-packed steam and water glands. Address Box No. 200, care of INDIA RUBBER WORLD.

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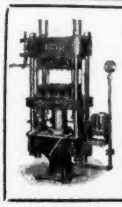
ANY DIAMETER, ANY LENGTH
The W. F. Gammeter Co., Cadiz, Ohio



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Plain or Semi-automatic—Any Size or pressure—Pumps, Valves, etc.
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THE BARR RUBBER PRODUCTS COMPANY
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IMMEDIATE DELIVERIES FROM STOCK
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319-323 FRELINGHUYSEN AVE. NEWARK, N. J.
CABLE ADDRESS "URME"

Dominion of Canada Statistics

Imports of Crude and Manufactured Rubber

	Twelve Months Ended December, 1931		Twelve Months Ended December, 1932	
UNMANUFACTURED	Pounds	Value	Pounds	Value
Rubber, gutta percha, etc...	56,582,678	$4,130,262	46,853,830	$2,136,389
Rubber, recovered	9,597,000	453,263	6,027,400	256,795
Rubber and gutta percha scrap	2,556,400	61,065	1,846,900	30,181
Balata	28,428	12,813	18,177	5,273
Rubber substitute	366,600	42,676	233,500	33,428
Totals	69,131,106	$4,700,079	54,979,807	$2,462,066
PARTLY MANUFACTURED				
Hard rubber sheets and rods.	20,490	$12,403	13,607	$9,752
Hard rubber tubes.....	.....	6,032	.....	6,434
Rubber thread not covered	300,840	250,249	161,415	125,730
Totals	321,330	$268,684	175,022	$141,916
MANUFACTURED				
Belting	.....	$85,750	.....	$48,798
Hose	.....	77,939	.....	45,518
Packing	.....	55,450	.....	38,609
Boots and shoes.....*pairs*	45,591	23,575	128,453	52,719
Clothing, including waterproofed	.....	71,187	.....	11,517
Raincoats .....*number*	32,661	91,773	14,056	44,505
Gloves	.....	18,607	.....	8,090
Hot water bottles.....	.....	27,665	.....	23,076
Tires, bicycle .....*number*	53,294	24,898	38,105	19,946
Pneumatic .....*number*	50,325	307,014	12,126	99,709
Inner tubes .....*number*	15,754	15,693	898	3,281
Solid for automobiles and motor trucks....*number*	683	22,228	476	24,917
Other solid tires	.....	35,447	.....	14,990
Mats and matting.....	.....	38,489	.....	38,603
Cement	.....	68,245	.....	51,894
Golf balls .....*dozen*	45,792	134,373	34,770	103,367
Heels .....*pairs*	694,545	22,677	94,884	7,222
Other rubber manufactures.	.....	1,104,249	.....	707,919
Totals	.....	$2,225,259	.....	$1,344,676
Totals, rubber imports..	.....	$7,194,022	.....	$3,948,658

Exports of Domestic and Foreign Rubber Goods

	Produce of Canada Value	Reexports of Foreign Goods Value	Produce of Canada Value	Reexports of Foreign Goods Value
UNMANUFACTURED				
Waste rubber	$48,349	.....	$27,116	.....
MANUFACTURED				
Belting	$269,031	.....	$193,392	.....
Canvas shoes with rubber soles	2,192,767	.....	628,191	.....
Boots and shoes.....	2,215,346	.....	1,607,058	.....
Clothing, including waterproofed	43,518	.....	53,150	.....
Heels	.....	.....	167,202	.....
Hose	124,556	.....	70,586	.....
Soles	.....	.....	107,790	.....
Tires, bicycle	6,312	.....	137	.....
Pneumatic	5,870,121	.....	3,044,889	.....
Inner tubes	592,658	.....	202,535	.....
Solid	9,261	.....	1,975	.....
Other rubber manufactures..	2,090,249	$45,783	568,027	$134,960
Totals	$13,413,819	$45,783	$6,644,932	$134,960
Totals, rubber exports	$13,462,168	$45,783	$6,672,048	$134,960

Low and High New York Spot Prices

All Prices in Cents per Pound

	April		
PLANTATIONS	1933*	1932	1931
Thin latex crepe.....	3¾/4 1/8	3 1/8/4 1/4	6 /7 1/8
Smoked sheet, ribbed.....	2 1/8/4 3/8	2 1/8/3 1/8	5 7/8/6 7/8
PARAS			
Upriver fine.....	6 /6½	5 /5¼	8¼/9

*Figured to April 25, 1933.

Imports by Customs Districts

	February, 1933 *Crude Rubber		February, 1932 *Crude Rubber	
	Pounds	Value	Pounds	Value
Massachusetts	5,784,768	$192,358	2,199,856	$99,564
New York	36,632,246	1,129,577	53,695,460	2,365,792
Philadelphia	1,040,251	35,604	.....	.....
Maryland	431,739	14,042	2,021,944	68,846
Georgia	.....	.....	1,641,300	54,276
Mobile	.....	.....	1,153,600	42,859
New Orleans	324,800	9,991	303,317	8,660
Los Angeles	6,878,528	206,780	2,534,383	98,562
San Francisco	44,998	1,658	22,400	1,230
Oregon	11,200	491	11,200	600
Colorado	302,400	9,622	.....	.....
Michigan	.....	.....	400	35
Ohio	.....	.....	27,682	2,008
Totals	51,450,930	$1,600,123	63,611,542	$2,742,432

*Crude rubber including latex dry rubber content.

World Rubber Shipments—Net Exports

Long Tons

	Calendar Years		1933		
British Malaya	1931	1932	Jan.	Feb.	Mar.
Gross exports	519,740	478,252	46,599	37,564	42,059
Imports	125,506	92,539	7,857	6,167	7,964
Net	394,234	385,713	38,742	31,397	34,095
Ceylon	61,766	49,714	4,602	5,064	4,827
India and Burma.....	8,470	3,758	318	304	.....
Sarawak	10,451	6,960	590	541	571
British N. Borneo.....	6,247	5,379	*400	*400	*400
Siam	4,218	3,460	305	368	304
Java and Madura.....	75,952	61,271	4,766	4,895	.....
Sumatra E. Coast.....	87,747	79,836	5,630	5,119	.....
Other N. E. Indies.....	116,009	87,185	6,729	5,683	.....
French Indo-China	11,713	14,376	1,957	896	1,047
Amazon Valley	12,121	6,420	554	620	.....
Other America	222	39	.....	.....	.....
Africa	3,072	1,751	*100	*100	*100
Totals	792,222	705,862	64,693	55,387	.....

Compiled by Rubber Division, Washington, D. C.

Plantation Rubber Crop Returns by Months

	Borneo (26 Companies)		Ceylon (102 Companies)		India and Burma (21 Companies)		Malaya (338 Companies)		Netherlands East Indies Java (60 Companies)		Netherlands East Indies Sumatra (60 Companies)		Miscellaneous (8 Companies)		Total (615 Companies)	
1932	Long Tons	Index	Long Tons	Index	Long Tons	Index	Long Tons	Index	Long Tons	Index	Long Tons	Index	Long Tons	Index	Long Tons	Index
January	352	72.0	1,378	67.5	208	37.0	14,409	115.9	2,780	105.9	4,712	116.9	212	117.1	24,051	107.5
February	336	68.7	778	36.2	82	14.6	11,854	95.3	2,701	102.9	3,894	96.6	120	66.3	19,725	88.2
March	365	74.6	1,187	58.2	152	27.0	11,355	91.3	3,017	114.9	4,210	104.4	143	79.0	20,429	91.4
April	318	65.0	1,209	59.2	149	26.5	11,991	96.4	2,609	99.4	4,046	100.3	163	90.1	20,485	91.6
May	277	56.6	897	43.9	99	17.6	12,711	102.2	2,373	90.4	4,362	108.2	171	94.5	20,890	93.4
June	298	60.9	1,196	58.6	36	6.4	12,353	99.3	2,166	82.5	4,256	105.6	167	92.3	20,472	91.5
July	308	63.0	1,221	59.8	16	2.8	13,069	105 1	2,078	79.1	4,166	103.3	140	77.3	20,998	93.9
August	307	62.8	954	46.7	30	5.3	12,728	102.4	1,616	61.5	4,065	100.8	134	74.0	19,834	88.7
September	293	59.9	1,096	53.7	44	7.8	11,635	93.6	1,494	56.9	4,347	107.8	116	61.7	19,025	85.1
October	342	69.9	976	47.8	97	17.3	12,254	98.6	2,157	82.1	4,214	104.5	118	65.2	20,158	90.1
November	344	70.3	1,194	58.5	132	23.5	11,858	95.4	2,440	92.9	4,191	103.9	135	74.6	20,294	90.7
December	359	73.4	1,574	77.1	157	27.9	13,781	110.8	2,335	88.9	4,298	106.6	128	70.7	22,632	101.2
Totals	3,899	...	13,620	...	1,202	...	149,998	...	27,766	...	50,761	...	1,747	...	248,993	...
MONTHLY AVERAGE	325	66.5	1,135	55.6	100	17.8	12,500	100.5	2,314	88.1	4,230	104.9	146	80.7	20,750	92.8
1933																
January	355	72.6	1,139	55.8	120	21.4	12,432	100.0	2,479	94.4	3,838	95.2	125	69.1	20,488	91.6
February	318	65.0	877	43.0	48	8.5	11,613	93.4	2,605	99.2	3,794	94.1	58	32.0	19,313	86.4
2 months ending February, 1933	673	...	2,016	...	168	...	24,045	...	5,084	...	7,632	...	183	...	39,801	...
1932	688	...	2,116	...	290	...	26,263	...	5,481	...	8,606	...	332	...	43,776	...

NOTE. Index figures throughout are based on the monthly average for 1929 = 100. Issued March 24, 1933, by the Commercial Research Department, The Rubber Growers' Association, Inc., London, England.

United States Statistics

Imports of Crude and Manufactured Rubber

	January, 1932		January, 1933	
UNMANUFACTURED—*Free*	Pounds	Value	Pounds	Value
Crude rubber	74,414,859	$3,387,505	66,801,222	$2,213,828
Liquid latex	742,235	40,613	1,882,928	100,900
Jelutong or pontianak	1,418,724	81,396	800,063	40,586
Balata	121,650	14,095	74,039	7,815
Gutta percha	33,535	6,062	64,636	5,058
Siak, scrap, and reclaimed	448,473	5,856	256,135	1,176
Totals	77,179,476	$3,535,527	69,879,023	$2,369,363
Chicle, crude—*Free*	214,320	$96,923	402,109	$115,745
MANUFACTURED—*Dutiable*				
Rubber soled footwear with fabric uppers—*pairs*	.....	.....	465,682	$60,445
Rubber toys	.....	.....	.....	34,264
Druggists' sundries, n. e. s.	.....	.....	.....	6,694
Combs, hard rubber—*number*	.....	.....	637,238	17,588
Golf balls—*number*	.....	.....	11,196	2,787
Tennis and other rubber balls—*number*	.....	.....	214,624	7,116
Tires—*number*	940	$5,150	14,416	67,781
Other rubber manufactures	.....	48,611	.....	31,591
Totals	.....	$53,761	.....	$228,266

Exports of Foreign Merchandise

RUBBER AND MANUFACTURES				
Crude rubber	3,570,828	$185,466	3,211,106	$111,811
Balata	6,048	1,062	12,729	2,595
Gutta percha, rubber substitutes, and scrap	50	45	.....	.....
Rubber manufactures	.....	92	.....	469
Totals	.....	$186,665	.....	$114,875

Exports of Domestic Merchandise

RUBBER AND MANUFACTURES				
Reclaimed	1,065,109	$45,649	291,355	$8,906
Scrap and old	4,161,924	71,790	2,913,124	42,653
Rubberized automobile cloth, *sq. yd.*	50,449	18,641	45,426	20,166
Other rubberized piece goods and hospital sheeting, *sq. yd.*	54,120	17,581	39,204	14,859
Footwear				
Boots—*pairs*	27,676	59,021	5,445	10,266
Shoes—*pairs*	15,747	11,285	6,882	4,592
Canvas shoes with rubber soles—*pairs*	19,040	11,659	15,238	8,857
Soles—*doz. pairs*	3,000	6,116	829	2,112
Heels—*doz. pairs*	33,239	21,329	27,998	16,002
Water bottles and fountain syringes—*number*	13,233	4,685	11,033	3,765
Gloves—*doz. pairs*	4,882	10,947	3,558	7,395
Other druggists' sundries	.....	27,654	.....	21,350
Balloons—*gross*	29,303	23,013	19,789	18,111
Toys and balls	.....	1,826	.....	1,967
Bathing caps—*doz.*	1,050	2,056	2,297	4,134
Bands	28,324	9,008	14,549	4,075
Erasers	17,033	10,649	20,598	12,126
Hard rubber goods				
Electrical goods	112,890	11,903	72,733	6,530
Other goods	.....	7,242	.....	3,984
Tires				
Truck and bus casings, *number*	16,493	256,627	8,856	146,482
Other automobile casings, *number*	50,971	389,658	61,664	444,184
Tubes, auto—*number*	53,039	60,786	38,666	38,129
Other casings and tubes, *number*	1,402	3,881	1,355	3,372
Solid tires for automobiles and motor trucks, *number*	631	16,367	432	11,585
Other solid tires	183,411	21,516	55,866	5,997
Tire sundries and repair materials	.....	36,884	.....	25,545
Rubber and friction tape	81,360	18,155	35,739	8,561
Belting	149,448	60,112	137,714	61,594
Hose	260,189	67,197	171,241	41,357
Packing	79,843	32,647	58,355	23,576
Thread	100,299	60,753	142,216	76,639
Other rubber manufactures	.....	80,431	.....	66,979
Totals	.....	$1,477,068	.....	$1,165,850

London Stocks, February, 1933

			Stocks, February 28		
LONDON	Landed Tons	Delivered Tons	1933 Tons	1932 Tons	1931 Tons
Plantation	3,273	2,576	37,127	65,902	82,168
Other grades	4	.....	55	40	50
LIVERPOOL					
Plantation	*2,144	*1,723	*52,990	*60,016	*44,656
Total tons, London and Liverpool	5,421	4,299	90,172	125,958	126,874

*Official returns from the recognized public warehouses.

Rubber Goods Production Statistics

TIRES AND TUBES	1932 Total	1932 January	1933 January
Pneumatic casings			
Production—*thousands*	32,067	2,770	1,806
Shipments, total—*thousands*	32,440	2,602	2,077
Domestic—*thousands*	31,639	2,545	2,011
Stocks, end of month—*thousands*	73,395	6,329	5,789
Solid and cushion tires			
Production—*thousands*	100	9	6
Shipments, total—*thousands*	107	9	7
Domestic—*thousands*	103	9	7
Stocks, end of month—*thousands*	350	37	22
Inner tubes			
Production—*thousands*	29,514	2,719	1,675
Shipments, total—*thousands*	30,507	2,803	2,028
Domestic—*thousands*	29,960	2,761	1,989
Stocks, end of month—*thousands*	68,803	6,175	4,957
Raw material consumed			
Fabrics—*thous. of lbs.*	128,980	12,156	7,899
MISCELLANEOUS PRODUCTS			
Rubber bands, shipments—*thous. of lbs.*	2,398	266	189
Rubber clothing, calendered			
Orders, net—*no. coats and sundries*	195,921	20,720	11,574
Production—*no. coats and sundries*	263,786	10,130	24,409
Rubber-proofed fabrics, production, total—*thous. of yds.*	33,232	2,184	2,052
Auto fabrics—*thous. of yds.*	3,354	339	221
Raincoat fabrics—*thous. of yds.*	15,935	853	799
Rubber flooring, shipments—*thous. of sq. ft.*	4,764	349	188
Rubber and canvas footwear			
Production, total—*thous. of pairs*	47,764	3,557	3,725
Tennis—*thous. of pairs*	26,543	2,496	1,913
Waterproof—*thous. of pairs*	21,222	1,061	1,812
Shipments, total—*thous. of pairs*	54,299	3,990	3,156
Tennis—*thous. of pairs*	28,705	2,374	1,814
Waterproof—*thous. of pairs*	25,595	1,616	1,342
Shipments, domestic, total—*thous. of pairs*	53,677	3,962	3,136
Tennis—*thous. of pairs*	27,913	2,353	1,801
Waterproof—*thous. of pairs*	25,413	1,610	1,335
Stocks, total, end of month—*thous. of pairs*	209,957	20,237	15,351
Tennis—*thous. of pairs*	75,410	8,510	7,008
Waterproof—*thous. of pairs*	134,549	11,726	8,343
Rubber heels			
Production—*thous. of pairs*	155,243	12,316	13,142
Shipments, total—*thous. of pairs*	157,557	12,425	11,336
Export—*thous. of pairs*	3,095	290	209
Repair trade—*thous. of pairs*	45,436	3,431	2,433
Shoe manufacturers—*thous. of pairs*	109,027	8,704	8,694
Stocks, end of month—*thous. of pairs*	298,608	24,515	21,808
Rubber soles			
Production—*thous. of pairs*	41,646	3,411	4,247
Shipments, total—*thous. of pairs*	41,452	3,226	3,777
Export—*thous. of pairs*	71	8	1
Repair trade—*thous. of pairs*	2,599	264	275
Shoe manufacturers—*thous. of pairs*	38,784	2,954	3,502
Stocks, end of month—*thous of pairs*	28,572	2,085	2,766
Mechanical rubber goods, shipments			
Total—*thous. of dollars*	27,699	2,463	2,060
Belting—*thous. of dollars*	5,677	483	382
Hose—*thous. of dollars*	11,078	903	730
Other—*thous. of dollars*	10,945	1,077	949

Source: *Survey of Current Business*, Bureau of Foreign & Domestic Commerce, Washington, D. C.

Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

No.	COMMODITY	CITY AND COUNTRY
*†3,516	Electric attachment rubber plugs and caps, and electric connectors	Winnipeg, Canada
*†3,524	Chewing gum in tablet form	Brussels, Belgium
*†3,541	Surgical gloves, etc.	Istanbul, Turkey
*3,556	Battery containers	Caracas, Venezuela
*3,581	Rubber heel making machinery	Guatemala City, Guatemala
*†3,589	Rod and piston packings	Milan, Italy
†3,590	Shoes	Manila, Philippine Islands
*3,605	Truck tires and tubes	Antofagasta, Chile
*†3,686	Elastic webbing looms	London, England
*†3,695	Tennis balls	Medan, Sumatra
*†3,702	Rubberized automobile top material	Buenos Aires, Argentina
*3,721	Druggists' sundries	Oruro, Bolivia
*3,794	2-Way elastic corset webbing	Stockholm, Sweden
*3,801	Zinc oxide, calcium carbonate, magnesium carbonate, and kaolin for use in manufacturing rubber heels	Barranquilla, Colombia
*3,815	Old tires	Hong Kong, China
‡3,816	Raincoats	London, England
*†3,873	Heels	Medan, Sumatra
*†3,878	Belting	Bucaramanga, Colombia
*†3,889	Bathing caps	Prague, Czechoslovakia
*†3,893	Rubber sundries and specialties	Mexico, Mexico
*†3,907	Household sundries	Aucon, Panama
‡3,938	Rubber bands	Alexandria, Egypt
*3,960	Sheeting	Liverpool, England
‡3,970	Druggists' sundries	Dar-es-Salaam, British East Africa

*Purchase. †Agency. *†Purchase or agency. ‡Purchase and agency, or either.

ERNEST JACOBY

Crude Rubber
Liquid Latex
Carbon Black
Clay

Stocks of above carried at all times

BOSTON MASS.
Cable Address: Jacobite Boston

Classified Advertisements

CONTINUED

SITUATIONS WANTED—Continued

SITUATION WANTED: MANUFACTURERS' REPRESENTATIVE mechanical rubber goods or rubber products for Chicago and vicinity. References furnished. Address Box No. 213, care of INDIA RUBBER WORLD.

EXECUTIVE POSITION WANTED IN THE EAST BY A SUPERintendent for years in charge of a plant making a full line of rubber clothing and responsible for the rubberizing of necessary fabrics. Conservative, dependable, and progressive. Management with a wide experience in developing new materials and processes commend this executive. Address Box No. 214, care of INDIA RUBBER WORLD.

SITUATION OPEN

CHEMIST AND COMPOUNDER WANTED FOR FACTORY MAKing mechanical rubber goods. Give full details in first letter as to type of experience, salary expected, etc. Address Box No. 210, care of INDIA RUBBER WORLD.

BUSINESS OPPORTUNITIES

INVENTORS: A GOING MANUFACTURING AND SALES COMpany is interested in financing and promoting new developments in the rubber industry. Address Box No. 201, care of INDIA RUBBER WORLD.

WANTED: A MATERIAL TO BE USED EITHER IN SOLUTION or otherwise, which will not only prevent molded rubber articles from sticking to the mold, but will impart at the same time a maximum of dry glossiness to the surfaces of the articles. Address Box No. 202, care of INDIA RUBBER WORLD.

WANTED: RUBBER MANUFACTURING PLANT

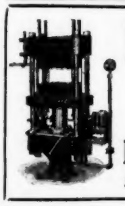
Old established, highly rated concern desires to rent part or all of a RUBBER FACTORY full yequipped to manufacture molded rubber goods; within radius hundred miles of New York, but outside New York city limits. Address Box No. 211, care of INDIA RUBBER WORLD.

MACHINERY AND SUPPLIES FOR SALE

FOR SALE: ONE 18 BY 54" BIRMINGHAM 4-ROLL CALENDER; one unused 18 by 30" heavy duty Farrel mill, chain drive; complete line of W. & P. mixers, vacuum shelf driers, calenders, mills, colloid mills, pebble mills, dough mixers, hydraulic presses, pumps, etc. Rebuilt, guaranteed. What machinery have you for sale? CONSOLIDATED PRODUCTS CO., INC., 13-16 Park Row, New York, N. Y.

FOR SALE: ONE NEW HYDRAULIC AUTOCLAVE PRESS PAN, 5' 6" diameter, with mold space 12', suitable for working steam pressure of 60 lbs. per sq. in.; ram 24" diameter, working in cast steel cylinder, for hydraulic working pressure of 1,700 lbs. per sq. in.; inlet, outlet, and water connections fitted; head supported by 4 steel columns; bayonet-type-joint lid and outside-packed steam and water glands. Address Box No. 200, care of INDIA RUBBER WORLD.

CALENDER SHELLS
ANY DIAMETER, ANY LENGTH
The W. F. Gammeter Co., Cadiz, Ohio



PLASTICS MOLDING PRESSES
Plain or Semi-automatic—Any Size or pressure—Pumps, Valves, etc.
Dunning & Boschert Press Co., Inc.
336 W. WATER ST. SYRACUSE, N. Y.

NORMAL - CONCENTRATED - PROCESSED
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Always In Stock For Immediate Delivery
HEVEATEX CORPORATION
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MELROSE, MASS.

Genasco Hydrocarbon
A hard, stable compound—produced under the exacting supervision of an experienced and up-to-date laboratory.
Aging tests have proved Genasco to be *always* of uniform quality. Shipped to all parts of the world in metal drums. Stocks carried at Maurer, N. J. and Madison, Ill.
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Philadelphia New York Chicago St. Louis

INTERNATIONAL PULP CO.
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Elastic Bands—Tubing—Bladders
Rubber Footwear—Rubber Roll Covering
Hand Made and Molded Specialties
TYER RUBBER COMPANY
Main Street Andover, Mass., U. S. A.

MECHANICAL MOLDED RUBBER GOODS
We Solicit Your Inquiries
THE BARR RUBBER PRODUCTS COMPANY
SANDUSKY, OHIO

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GUARANTEED REBUILT MACHINERY
IMMEDIATE DELIVERIES FROM STOCK
MILLS, CALENDERS, TUBERS, HYDRAULIC PRESSES, PUMPS, VULCANIZERS, TIRE MAKING EQUIPMENT, MOULDS, ETC.
UNITED RUBBER MACHINERY EXCHANGE
319-323 FRELINGHUYSEN AVE. NEWARK, N. J.
CABLE ADDRESS "URME"

Dominion of Canada Statistics

Imports of Crude and Manufactured Rubber

	Twelve Months Ended December, 1931		Twelve Months Ended December, 1932	
UNMANUFACTURED	Pounds	Value	Pounds	Value
Rubber, gutta percha, etc...	56,582,678	$4,130,262	46,853,830	$2,136,389
Rubber, recovered	9,597,000	453,263	6,027,400	256,795
Rubber and gutta percha scrap	2,556,400	61,065	1,846,900	30,181
Balata	28,428	12,813	18,177	5,273
Rubber substitute	366,600	42,676	233,500	33,428
Totals	69,131,106	$4,700,079	54,979,807	$2,462,066
PARTLY MANUFACTURED				
Hard rubber sheets and rods.	20,490	$12,403	13,607	$9,752
Hard rubber tubes.....	.....	6,032	.....	6,434
Rubber thread not covered	300,840	250,249	161,415	125,730
Totals	321,330	$268,684	175,022	$141,916
MANUFACTURED				
Belting	.....	$85,750	.....	$48,798
Hose	.....	77,939	.....	45,518
Packing	.....	55,450	.....	38,609
Boots and shoes.....*pairs*	45,591	23,575	128,453	52,719
Clothing, including waterproofed	.....	71,187	.....	11,517
Raincoats .....*number*	32,661	91,773	14,056	44,505
Gloves	.....	18,607	.....	8,090
Hot water bottles.....	.....	27,665	.....	23,076
Tires, bicycle .....*number*	53,294	24,898	38,105	19,946
Pneumatic .....*number*	50,325	307,014	12,126	99,709
Inner tubes .....*number*	15,754	15,693	898	3,281
Solid for automobiles and motor trucks....*number*	683	22,228	476	24,917
Other solid tires	.....	35,447	.....	14,990
Mats and matting.....	.....	38,489	.....	38,603
Cement	.....	68,245	.....	51,894
Golf balls .....*dozen*	45,792	134,373	34,770	103,367
Heels .....*pairs*	694,545	22,677	94,884	7,222
Other rubber manufactures.	.....	1,104,249	.....	707,919
Totals	.....	$2,225,259	.....	$1,344,676
Totals, rubber imports..	.....	$7,194,022	.....	$3,948,658

Exports of Domestic and Foreign Rubber Goods

	Produce of Canada Value	Reexports of Foreign Goods Value	Produce of Canada Value	Reexports of Foreign Goods Value
UNMANUFACTURED				
Waste rubber	$48,349	.....	$27,116	.....
MANUFACTURED				
Belting	$269,031	.....	$193,392	.....
Canvas shoes with rubber soles	2,192,767	.....	628,191	.....
Boots and shoes.....	2,215,346	.....	1,607,058	.....
Clothing, including waterproofed	43,518	.....	53,150	.....
Heels	.....	.....	167,202	.....
Hose	124,556	.....	70,586	.....
Soles	.....	.....	107,790	.....
Tires, bicycle	6,312	.....	137	.....
Pneumatic	5,870,121	.....	3,044,889	.....
Inner tubes	592,658	.....	202,535	.....
Solid	9,261	.....	1,975	.....
Other rubber manufactures..	2,090,249	$45,783	568,027	$134,960
Totals	$13,413,819	$45,783	$6,644,932	$134,960
Totals, rubber exports..	$13,462,168	$45,783	$6,672,048	$134,960

Low and High New York Spot Prices

All Prices in Cents per Pound

	April		
PLANTATIONS	1933*	1932	1931
Thin latex crepe.....	3¾/4 1/16	3 1/16/4 1/4	6 /7 1/8
Smoked sheet, ribbed	2 1/16/4 3/16	2 1/16/3 1/8	5 7/8/6 7/8
PARAS			
Upriver fine.....	6 /6½	5 /5¼	8¼/9

*Figured to April 25, 1933.

Imports by Customs Districts

	February, 1933—*Crude Rubber		February, 1932—*Crude Rubber	
	Pounds	Value	Pounds	Value
Massachusetts	5,784,768	$192,358	2,199,856	$99,564
New York	36,632,246	1,129,577	53,695,460	2,365,792
Philadelphia	1,040,251	35,604	.....	.....
Maryland	431,739	14,042	2,021,944	68,846
Georgia	.....	.....	1,641,300	54,276
Mobile	.....	.....	1,153,600	42,859
New Orleans	324,800	9,991	303,317	8,660
Los Angeles	6,878,528	206,780	2,534,383	98,562
San Francisco	44,998	1,658	22,400	1,230
Oregon	11,200	491	11,200	600
Colorado	302,400	9,622	.....	.....
Michigan	.....	.....	400	35
Ohio	.....	.....	27,682	2,008
Totals	51,450,930	$1,600,123	63,611,542	$2,742,432

*Crude rubber including latex dry rubber content.

World Rubber Shipments—Net Exports

Long Tons

	Calendar Years		1933		
British Malaya	1931	1932	Jan.	Feb.	Mar.
Gross exports	519,740	478,252	46,599	37,564	42,059
Imports	125,506	92,539	7,857	6,167	7,964
Net	394,234	385,713	38,742	31,397	34,095
Ceylon	61,766	49,714	4,602	5,064	4,827
India and Burma.....	8,470	3,758	318	304	.....
Sarawak	10,451	6,960	590	541	571
British N. Borneo.....	6,247	5,379	*400	*400	*400
Siam	4,218	3,460	305	368	304
Java and Madura.....	75,952	61,271	4,766	4,895	.....
Sumatra E. Coast.....	87,747	79,836	5,630	5,119	.....
Other N. E. Indies.....	116,009	87,185	6,729	5,683	.....
French Indo-China	11,713	14,376	1,957	896	1,047
Amazon Valley	12,121	6,420	554	620	.....
Other America	222	39	.....	.....	.....
Africa	3,072	1,751	*100	*100	*100
Totals	792,222	705,862	64,693	55,387	.....

Compiled by Rubber Division, Washington, D. C.

Plantation Rubber Crop Returns by Months

	Borneo (26 Companies)		Ceylon (102 Companies)		India and Burma (21 Companies)		Malaya (338 Companies)		Netherlands East Indies—Java (60 Companies)		Netherlands East Indies—Sumatra (60 Companies)		Miscellaneous (8 Companies)		Total (615 Companies)	
1932	Long Tons	Index	Long Tons	Index	Long Tons	Index	Long Tons	Index	Long Tons	Index	Long Tons	Index	Long Tons	Index	Long Tons	Index
January	352	72.0	1,378	67.5	208	37.0	14,409	115.9	2,780	105.9	4,712	116.9	212	117.1	24,051	107.5
February	336	68.7	738	36.2	82	14.6	11,854	95.3	2,701	102.9	3,894	96.6	120	66.3	19,725	88.2
March	365	74.6	1,187	58.2	152	27.0	11,355	91.3	3,017	114.9	4,210	104.4	143	79.0	20,429	91.4
April	318	65.0	1,209	59.2	149	26.5	11,991	96.4	2,609	99.4	4,046	100.3	163	90.1	20,485	91.6
May	277	56.6	897	43.9	99	17.6	12,711	102.2	2,373	90.4	4,362	108.2	171	94.5	20,890	93.4
June	298	60.9	1,196	58.6	36	6.4	12,353	99.3	2,166	82.5	4,256	105.6	167	92.3	20,472	91.5
July	308	63.0	1,221	59.8	16	2.8	13,069	105 1	2,078	79.1	4,166	103.3	140	77.3	20,998	93.9
August	307	62.8	954	46.7	30	5.3	12,728	102.4	1,616	61.5	4,065	100.8	134	74.0	19,834	88.7
September	293	59.9	1,096	53.7	44	7.8	11,635	93.6	1,494	56.9	4,347	107.8	116	61.7	19,025	85.1
October	342	69.9	976	47.8	97	17.3	12,254	98.6	2,157	82.1	4,214	104.5	118	65.2	20,158	90.1
November	344	70.3	1,194	58.5	132	23.5	11,858	95.4	2,440	92.9	4,191	103.9	135	74.6	20,294	90.7
December	359	73.4	1,574	77.1	157	27.9	13,781	110.8	2,335	88.9	4,298	106.6	128	70.7	22,632	101.2
Totals	3,899	...	13,620	...	1,202	...	149,998	...	27,766	...	50,761	...	1,747	...	248,993	...
MONTHLY AVERAGE	325	66.5	1,135	55.6	100	17.8	12,500	100.5	2,314	88.1	4,230	104.9	146	80.7	20,750	92.8
1933																
January	355	72.6	1,139	55.8	120	21.4	12,432	100.0	2,479	94.4	3,838	95.2	125	69.1	20,488	91.6
February	318	65.0	877	43.0	48	8.5	11,613	93.4	2,605	99.2	3,794	94.1	58	32.0	19,313	86.4
2 months ending February, 1933	673	...	2,016	...	168	...	24,045	...	5,084	...	7,632	...	183	...	39,801	...
1932	688	...	2,116	...	290	...	26,263	...	5,481	...	8,606	...	332	...	43,776	...

NOTE. Index figures throughout are based on the monthly average for 1929 = 100. Issued March 24, 1933, by the Commercial Research Department, The Rubber Growers' Association, Inc., London, England.